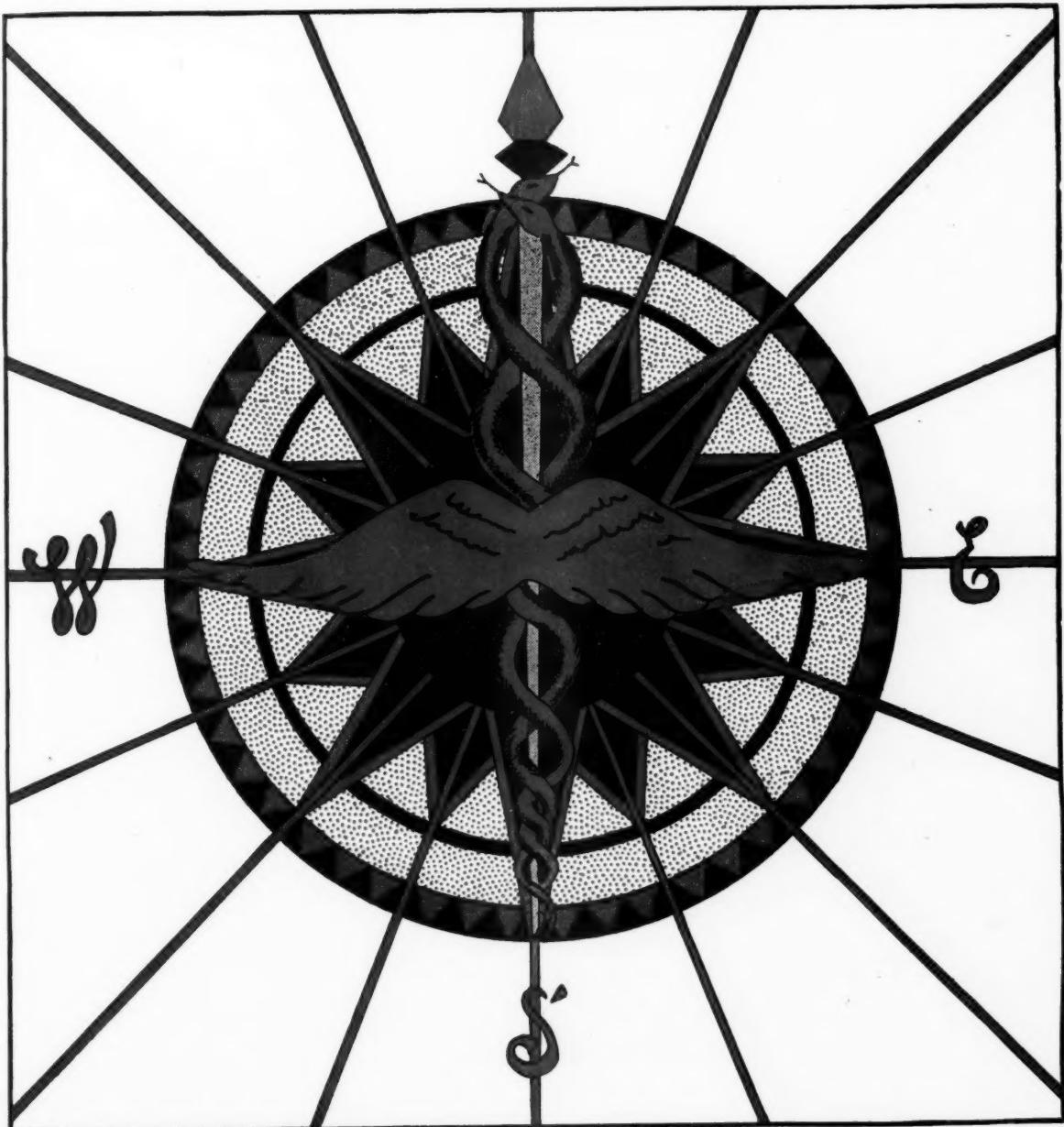


THE JOURNAL
OF THE
Michigan State Medical Society

Directory Number



Volume 42

MAY, 1943
YEARLY SUBSCRIPTION \$5.00—SINGLE COPY 50 CENTS

No. 5

Precision IN ESTROGENIC THERAPY

The application of new refinements in diagnostic technique enhances the effectiveness of modern estrogenic therapy.

Now, completely satisfactory treatment is

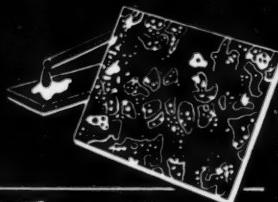
easily planned and maintained.

These three simple steps ensure precise, controlled results with a minimum of time and effort:

1

SIMPLIFY DIAGNOSIS

Reveal the degree of ovarian function by staining the vaginal smear with Single Differential Stain (Shorr).



2

SELECT THE MEDICATION

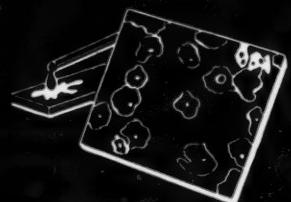
Choose a suitable dosage form from the convenient variety of Wyeth Estrogenic Preparations.



3

ACCURATELY DETERMINE RESPONSE TO THERAPY

Ascertain the effect of medication by observing the changes reflected in the stained vaginal smear.



Wyeth's ESTROGENIC PRODUCTS

NATURAL

SOLUTION OF ESTROGENS

- Ampoules: 5,000 International Units in 1 cc. corn oil
1 cc. ampoule - Boxes of 6, 50 and 100
5 cc. ampoule - Boxes of 1 each
- Ampoules: 10,000 International Units in 1 cc. corn oil
1 cc. ampoule - Boxes of 6, 50 and 100
5 cc. ampoule - Boxes of 1 each
- Ampoules: 20,000 International Units in 1 cc. corn oil
1 cc. ampoule - Boxes of 6, 50 and 100

SYNTHETIC

DIETHYLSTILBESTROL (Stilbestrol)

- Tablets: 0.1 mg. { Bottles of 40 and 500
0.5 mg. {
Ampoules: 0.5 mg. in 1 cc. corn oil; Boxes of 6,
1.0 mg. in 1 cc. corn oil; Boxes of 50 and 100
- Suppositories: 0.1 mg. { Boxes of 12
0.5 mg. {

*Reg. U. S. Pat. Off.

SINGLE DIFFERENTIAL STAIN (SHORR)



Requiring only a 3-minute office procedure, Single Differential Stain (Shorr) reveals the extent of cornification in the cells of the vaginal smear, providing an index of ovarian function essential to proper diagnosis and treatment.

Shorr Stain is available in packages of two Pondits*, each containing sufficient dry material for preparing enough stain for 200 slides.



NOW AVAILABLE: A new folder containing complete information about this time-saving Wyeth product. It contains directions for applying the stain and full-color reproductions of characteristic stained slides. Your Wyeth representative has a copy for you.

JOHN WYETH & BROTHER, INC., PHILADELPHIA

*Minimum discomfort and
inconvenience to patients from . . .*

SOLUTION LIVER EXTRACT

[PARENTERAL]

Lederle

BECAUSE OF ITS SMALL VOLUME, low concentration of solids and high concentration of anti-anemic substances, a minimum of discomfort and inconvenience to the patient may be expected from the administration of concentrated "Solution Liver Extract (Parenteral) *Lederle*," (15 U.S.P. Injectable Units per cc.).

For physicians who prefer to give fewer units of active material at more frequent intervals, there is "Refined Solution Liver Extract (Parenteral) *Lederle*," 5 U.S.P. Injectable Units per cc. and 10 U.S.P. Injectable Units

per cc. In addition, there is "Solution Liver Extract (Parenteral) *Lederle*," 3.3 U.S.P. Injectable Units per cc. A palatable oral solution containing not less than 1 U.S.P. Oral Unit per 60 cc. is also available.

All *Lederle's* Liver extracts conform to the United States Pharmacopoeia Twelfth Revision.
In the treatment of Pernicious Anemia with Liver Extract—



*Specify
Lederle*

LIVER PRODUCTS *Lederle*

"CONCENTRATED SOLUTION LIVER EXTRACT (PARENTERAL) *Lederle*" PACKAGES:

- 3—1 cc. vials (15 U.S.P. Injectable Units each)
- 1—10 cc. vial (150 U.S.P. Injectable Units each)

"REFINED SOLUTION LIVER EXTRACT (PARENTERAL) *Lederle*"

- 1—10 cc. vial 5 U.S.P. Injectable Units per cc. (50 units)
- 1—5 cc. vial 10 U.S.P. Injectable Units per cc. (50 units)
- 1—10 cc. vial 10 U.S.P. Injectable Units per cc. (100 units)

"SOLUTION LIVER EXTRACT (PARENTERAL) *Lederle*"

- 3—3 cc. vials (10 U.S.P. Injectable Units per vial)

"SOLUTION LIVER EXTRACT ORAL *Lederle*"

- 8 fluid ounce bottle (4 U.S.P. oral units)
- 1 pint (16 fluid ounce) bottle (8 U.S.P. oral units)

LEDERLE LABORATORIES, INC., NEW YORK, N.Y.—A UNIT OF AMERICAN CYANAMID COMPANY

WAR BULLETINS

4,405 WOUNDED IN SOLOMONS. BUT ONLY EIGHT DIE

Washington, D. C., March 27—Marines shot through the leg or thigh in the Solomon Islands were usually able to walk in four or five days after they were injured and were healed within 10 days.

The navy reported this today in telling of 4,039 cases of wounds or illness handled aboard a hospital ship and 366 patients treated at the mobile naval hospital at Auckland, New Zealand, a total of 4,405. About two-thirds of those taken aboard the hospital ship for transportation to Auckland had received initial treatment at base and field medical stations and of the total 4,039, only seven died. Of the 366 in the mobile hospital one man died from burns.

Comm. L. Kraeer Ferguson said most of the 4,039 patients were in "excellent condition" when they reached the hospital ship.

IMPROVED SERVICE

Dr. David D. Henry, Executive Vice President of Wayne University in addressing the graduating doctors March 10, 1943, decried the pessimistic foreboding of those who prophesy that the war will destroy America's educational institutions and announced his own conviction that they will emerge from the war period greater and stronger than ever. "It is possible," he said, "for hours of crisis, in ways unknown, to furnish and nurture the seeds of later greatness. Out of the adjustments, the stress, and the strains of chaotic times frequently comes the strength that stands us in good stead in later years."

For the College of Medicine itself he saw greatly expanded possibilities for serving the community and expressed faith that "the dreams and plans for the development of a great medical science center, adequately equipped and staffed . . . will materialize." He ended his address with a tribute to the courage

and efficiency of the doctors and an expression of confidence in their ability to meet the heavy demands which society now makes upon them.

INVALID DIETS AND FOOD RATIONING

Of interest to all who are concerned with diets for invalids is Ration Order 13, issued by the Office of Price Administration under date of February 9, 1943. This order covers all canned, dried, and frozen fruits and vegetables. Article II, Section 2.5 of the order reads as follows:

"Consumers who need more processed foods because of illness may apply for more points. (a) Any consumer whose health requires that he have more processed foods than he can get with War Ration Book Two, may apply for additional points. The application must be made on OPA form R-315, by the consumer himself or by someone acting for him, and may be made in person or by mail. The application can be made only to the board for the place where the consumer lives. He must submit with his application a written statement of a licensed or registered physician or surgeon, showing why he must have more processed foods, the amounts and types he needs during the next two months, and why he cannot use unrationed foods instead. (b) If the board finds that his health depends upon his getting more processed foods, and that he cannot use or cannot get unrationed foods, it shall issue to him one or more certificates for the number of points necessary to get the additional processed foods he needs during the next two months."

The application form referred to above, OPA Form R-315, is apt to be somewhat confusing to patients. It is titled "Sugar Special Purpose Application" and was developed primarily to meet the need for home canning. It is being used temporarily, until a more adequate form can be gotten out.

It is anticipated that the procedure indicated in Section 2.5 above may be changed somewhat in the future, in which case due notice will be provided.

MICHIGAN DOCTORS OF MEDICINE IN MILITARY SERVICE SUPPLEMENTAL LIST

Genesee

Backus, Glen R. Capt.
Branch, Hira E. Capt.
McArthur, R. H.
Miller, Loren E. Lt.

Ingham

Johnson, K. H.
McGillicuddy, O. B.
Robsen, Edmund J. USN

Ionia-Montcalm

Seidel, Karl E.

Jackson

Lake, William H.

Kent

Fee, Manson G.
Lavan, John

Lenawee

Marsh, R. G. B.

Northern Michigan

McCune, William S.

Oakland

Campbell, Malcolm D.
Domeier, L. H.
Faust, E. W.
Francis, Donald
Kirkup, Norman H.
Schlecte, Edwin Carl
Smith, Donald S.
Spencer, Lloyd H.
Stanley, William F. Lt.

Saginaw

Gage, David P. Capt.

Washtenaw

Cooper, James H.
Harris, Bradley M.
*Hudson, Charles L. Major
Salon, Dayton D. Capt.

Wayne

Andries, Ray M. Lt.
Arehart, Burke W. Lt. USN
*Bennett, Matthew C. Capt.
Blain, James H., Jr. Capt.
Bromme, William Major

Brooks, Nathan Capt.
Calkins, H. N. Capt.
Fraser, Harvey E. Capt.
Gitlin, Charles Capt.
Gollman, Maurice D. Capt.
Ihle, Lyman E. Capt.
*Kelly, Wendell C. Capt.
Kirschbaum, Harry M. Capt.
Knapp, Byron S. Capt.
Laberge, James M. Capt.
*Levine, Edward E. Lt.
McGarryah, Joseph A. Capt.
*Manning, John E. Capt.
Mayne, C. H. Capt.
Nagel, Oscar Lt.
Reiff, Morris V. Lt.
*Roney, A. A. Lt.
Roney, E. H. Lt.
Spurrier, Ethelbert Lt. Comdr.
Ulrich, Willis H. Major
Vincent, James L. Capt.
Wallace, S. Willard Capt.

Wexford

Albi, R. W.

*Indicates Non-member of MSMS.

JOUR. MSMS



The art of anatomic illustration entered a new epoch upon the publication of the *Tabulae Anatomicae* of Giulio Casserio (Venice, 1627). This female figure is one of Casserio's most beautiful copperplates.



THEELIN AQUEOUS SUSPENSION

For patients requiring high potencies, and for those who do not tolerate oil injections.

THEELIN AQUEOUS SUSPENSION provides the same pure, natural crystalline estrogen as Theelin in Oil, and the same effective clinical results may be expected in the treatment of menopausal syndrome and other conditions due to diminishing estrogenic secretion. Theelin Aqueous Suspension is administered intramuscularly. Normal saline solution—no suspending agent—is used in preparing this product and the ampoule need only be shaken gently before the preparation is drawn into the syringe.

The uniform potency of Theelin is certified by the Laboratories of both Parke, Davis & Company and St. Louis University. Kapoels Theelol (Oral) and Theelin Suppositories (Vaginal) are available for maintenance therapy and for use in milder hypogonadal conditions.

THEELIN AQUEOUS SUSPENSION

1-cc. ampoules, each cc. containing 2 mg. (20,000 I.U.) of Theelin suspended in normal saline solution.

THEELIN IN OIL

1-cc. ampoules in strengths up to 1 mg. (10,000 I.U.) of Theelin per cc.



PARKE, DAVIS & COMPANY
DETROIT, MICHIGAN

Reading Notices

CHEMOTHERAPY OF MALARIA

"Chemotherapy of Malaria," a review of the biological and statistical background of malaria, and of the literature on antimalarial chemotherapeutic agents, by Dr. James H. Williams, Stamford Research Laboratories, American Cyanamid Company, has just been published by Lederle Laboratories, Inc., New York.

The work is presented in five parts: I. Introduction and Biological Background (pp. 1-27), II. Sulfonamido Compounds and Sulfones as Antimalarials (pp. 28-58), III. Amidines as Antimalarials, (pp. 59-67), IV. Quinoline Compounds (exclusive of the cinchona derivatives) as Antimalarials (pp. 68-189), and V. Acridine Compounds as Antimalarials (pp. 190-273). Each part begins with an itemized Table of Contents, followed by a detailed discussion of individual compounds, with graphic formulas, tables, etc., and concludes with a bibliography of patents and literature references.

The book is 8½x11 inches, bound in heavy blue paper. Any research worker in the malarial field can obtain a copy, without charge, by sending his name, address, position and connections, to Lederle Laboratories, Inc., 30 Rockefeller Plaza, New York, N. Y.

DURING FOOD SHORTAGES

It is well to bear in mind that *dried brewers yeast, weight for weight, is the richest food source of the Vitamin B Complex.* For example, as little as 1 level teaspoon (2.5 Gm.) Mead's Brewers Yeast Powder supplies: 45 per cent of the average adult daily thiamine allowance, 8 per cent of the average adult daily riboflavin allowance, 10 per cent of the average adult daily niacin allowance.

This is in addition to the other factors that occur naturally in yeast such as pyrodoxin, pantothenic acid, etc.

Send for tested wartime recipes, the flavors of which are not affected by the inclusion of Mead's Brewers Yeast Powder; Mead Johnson & Company, Evansville, Indiana.

HORMONE DOSAGE AT A GLANCE

Schering is currently issuing a series of 6x9 inch charts enabling one to tell at a glance the dosage of hormones for various gynecological and endocrine disturbances. The first of these will deal with Dysmenorrhea. At regular intervals, thereafter, charts will be issued on other subjects such as the Male Climacteric and Functional Uterine Bleeding. These charts may well help clarify the maze of seemingly confusing terminology and dosage of endocrine disturbances, and should prove highly useful to practicing physicians.

Physicians may obtain copies of these charts by writing to the Medical Research Division, Schering Corporation, Bloomfield, New Jersey.

NEW G-U ANALGESIC AND ANTISEPTIC

A new analgesic and antiseptic for use in genitourinary conditions has been added to the line of E. R. Squibb & Sons under the name, "Cajandol." A preparation of 5 per cent oil of cajeput dissolved in peanut oil, with 0.1 per cent propylparahydroxybenzoate as preservative, Cajandol was developed at the Brady Urological Institute, Johns Hopkins Hospital, and has been in use there during the past several years.

Clinical experience has shown that Cajandol alleviates pain and distress due to instrumentation and fulguration. It is also beneficial in many types of acute and

chronic cystitis and other pathologic conditions of the bladder.

In treating these conditions, 10 c.c. to 15 c.c. of Cajandol are instilled into the bladder through a catheter at daily or bi-weekly intervals. In a few cases, Cajandol has been injected up the ureter during the use of the Councill stone extractor and has facilitated withdrawal of this instrument when there has been difficulty due to spasm of the ureter.

Cajandol is supplied in one-pint bottles only.

NEW SALESMANAGER APPOINTED

Appointment of Rafael C. Brewster as general salesmanager in charge of sales and advertising for Frederick Stearns and Company is announced by Erwin F. Fauser, president. His appointment, President Fauser said, is in line with Stearns' program of expansion of research and products.

Brewster's wide experience includes sales direction for E. R. Squibb and Son, Letheric, Inc., House of Westmore, Inc., and Canada Dry Ginger Ale, Inc. He also has been a member of two advertising agencies and of the staff of *Cosmopolitan Magazine*.

DOCTOR GUILD ELECTED PRESIDENT

Election of B. Thurber Guild, M.D., member of the staff of the Massachusetts General Hospital, Boston, as president of Fairchild Brothers and Foster, a subsidiary of Winthrop Chemical Company, was announced recently by Theodore G. Klumpp, M.D., president of the parent company.

Fairchild Brothers and Foster manufacture enzymes and other ethical pharmaceutical products.

Since 1920, Dr. Guild has specialized in internal medicine and the study and treatment of diseases due to allergy; and he has maintained a consultant practice in problems of dermatology complicated by allergy. He is a past president of the Dorchester Medical Society, consultant of the Council of Pharmacy and Chemistry of the American Medical Association, and councilor of the Massachusetts Medical Society. He is a member of the Society for Investigative Dermatology and the Society for the Study of Asthma and Allied Conditions, and is secretary of the Boston Allergy Round Table.

Dr. Guild's researches include a study of skin diseases of small animals conducted at the Angell Animal Hospital, Boston, and of problems of human skin irritations due to soap.

CLINICAL EVALUATION OF "SECONAL SODIUM"

During the course of a year, Dietrich (Anesth. & Analg., 22:28, 1943) attempted to evaluate "Seconal Sodium" (Sodium Propyl-methyl-carbonyl Allyl Barbiturate, Lilly) as a sedative in general pediatric practice. Over 3,700 doses of the drug were administered to more than 500 children and infants, both private and ward patients, without any untoward effects on pulse, temperature, blood pressure, or cerebrospinal fluid pressure. The drug proved to be an excellent general sedative possessed of some analgesic action, and in tetanus and in the performance of certain otherwise painful procedures where a general anesthetic was not desirable, such as pinch grafts, lumbar punctures, myringotomies, and incision and drainage of minor abscesses, it was of particular value.

When the age of the patient and freedom from gastric symptoms permit, "Seconal Sodium" should be
(Continued on Page 332)

For the infant
deprived of
mother's milk

SIMILAC

SIMILAR TO BREAST MILK



A powdered, modified milk product especially prepared for infant feeding, made from tuberculin tested cow's milk (casein modified) from which part of the butterfat is removed and to which has been added lactose, olive oil, coconut oil, corn oil, and cod liver oil concentrate.



Similac provides breast milk proportions of fat, protein, carbohydrate and minerals, in forms that are physically and metabolically suited to the infant's requirements. Similac dependably nourishes — *from birth until weaning.*

One level tablespoon of Similac powder added to two ounces of water makes two fluid ounces of Similac. This is the normal mixture and the caloric value is approximately 20 calories per fluid ounce.

M & R DIETETIC LABORATORIES, INC. • COLUMBUS, OHIO

READING NOTICES

(Continued from Page 330)

given by mouth. When administered by rectum, however, its action is only slightly retarded. The intact capsule may be inserted in the manner of a suppository by first pricking each end of the capsule with a pin; or, where fractional doses are desired, the powder may be suspended in tap water and given by rectum with a small syringe.

Dietrich found that for good sedation in children of average nutrition the following doses were appropriate: one to three months, $\frac{1}{4}$ to $\frac{1}{2}$ gr. by rectum; three to six months, $\frac{1}{2}$ to $\frac{3}{4}$ gr. by rectum; six to thirty-six months, $\frac{3}{4}$ to 1 gr. by rectum; three to eight years, $\frac{3}{4}$ gr. by mouth or $\frac{3}{4}$ to $1\frac{1}{2}$ grs. by rectum; eight to fifteen years, $\frac{3}{4}$ to $1\frac{1}{2}$ grs. by mouth or 1 to $1\frac{1}{2}$ grs. by rectum. For very deep sedation or for light analgesia some increase in dose may be necessary. Any dose in this schedule may be repeated safely once within an hour if the desired result is not obtained, or may be given with impunity every three to four hours if circumstances demand prolonged sedation.

COUNCIL AND COMMITTEE MEETINGS

April 4, 1943—Syphilis Control Committee—Olds Hotel, Lansing.

April 15, 1943—Distribution of Medical Care—Statler, Detroit.

April 15, 1943—Executive Committee of The Council—Statler, Detroit.

April 15, 1943—Mental Hygiene Committee—Ann Arbor.

May 2, 1943—Joint meeting of the Child Welfare Committee and Maternal Health Committee—Olds Hotel, Lansing.

May 19, 1943—Executive Committee of The Council—Statler, Detroit.

COUNTY MEDICAL SOCIETY MEETINGS

Bay—March 24, 1943—Nurses' Home Mercy Hospital—Speaker: Norman Westlund, M.D.

April 28, 1943—Wenonah Hotel—Postgraduate Conference.

Calhoun—April 6, 1943—Hart Hotel—Speakers: Hugh B. Robins, M.D. and W. L. Howard, M.D.—Subject: "The Tuberculosis Problem in Calhoun County."

Dickinson-Iron—April 8, 1943—Benzies Border Bar—Speaker: W. S. Jones, M.D., Subject: "The Eye and The General Practitioner."

Genesee—April 13, 1943—Elks Temple—Speakers: Franklin Top, M.D. and Robert B. Kennedy, M.D., who spoke on "Recent Advances in Immunization Procedures" and "Recent Advances in Obstetrics," respectively.

Gratiot-Isabella-Clare—April 15, 1943—Park Hotel, St. Louis, Michigan—State Representative T. J. Hoxie presented a résumé of the work of the 1943 Michigan Legislature.

The Society adopted the following resolution unanimously:

WHEREAS, the medical profession of the United States is ready to offer constructive leadership in the advancement of medical principles that will further medical service to all of the people, and to preserve, not only the science and art of medicine, but the

standards associated with the practice of medicine in America;

Now, THEREFORE, BE IT RESOLVED, that there be created by the A.M.A. House of Delegates a Committee on Medical Service which shall be composed of the following members: (1) The President of the American Medical Association, ex-officio. (2) The Immediate Past-President of the American Medical Association. (3) The Secretary of the American Medical Association, ex-officio. (4) A member of the Board of Trustees of the American Medical Association, designated and selected by the Board of Trustees. (5) One member of the American Medical Association elected as hereinafter provided from each of the nine geographical subdivisions of the United States.

Kalamazoo—April 20, 1943—Public Library Bldg.—Semi-Annual Extramural Courses—Franklin Top, M.D., spoke on "Recent Advances in Immunization Procedures" and Harold Henderson, M.D., spoke on "Recent Advances in Obstetrics." A panel discussion followed; Subject: "The Diagnostic Significance of Pain"—Participants: Carl G. Heller, M.D., Russell T. Costello, M.D., and Charley J. Smyth, M.D.

April 22, 1943—Public Library Bldg.—Speakers: W. L. Lowrie, M.D., spoke on "The Differential Diagnosis and Management of Hypertension" and Lawrence S. Fallis, M.D., spoke on "The Indications for and the Use of Plasma Transfusions." This was followed by a panel discussion on "The Diagnostic Significance of Pain"—Participants: Doctors Carl G. Heller, Russell T. Costello and Charley J. Smyth.

Kent—April 13, 1943—Browning Hotel—Speakers and Subjects: John L. Law, M.D., "Recent Advances in Immunization Procedures" and Milton Darling, M.D., "Recent Advances in Obstetrics."

Ingham—March 20, 1943—Hotel Olds—Speaker: Reed Nesbit, M.D., who spoke on "Common Diseases of the Prostate."

Ionia-Montcalm—April 8, 1943—Speaker: Norman Westlund, M.D., who spoke on "Emotional Factors in Physical Illness."

Jackson—April 20, 1943—Hotel Hayes Ballroom—Clinical Dialogue—Speakers: Gordon B. Myers, M.D., and John W. Hirshfeld, M.D., Topic: "The Newer Concepts in the Diagnosis and Management of Diseases of the Liver."

Washtenaw—April 13, 1943—Hotel Allenel—Speakers: F. A. Coller, M.D. and C. C. Sturgis, M.D.—Subject: "The Newer Concepts in the Diagnosis and Management of Diseases of the Liver."

Wayne—April 5, 1943—Art Institute—Speaker: Cyrus C. Sturgis, B.S., M.D., Subject: "Some Changes Made in Care of Civilian Patients Due to War Conditions."

April 19, 1943—Art Institute—Speaker: Carl George Heller, M.D.—Subject: "Failure of the Male Gonads With Reference to Therapy of the Male Climacteric and Eunuchoidism."

West Side Medical Society met April 21, 1943—Movie by J. Wyeth and Brother, on "Gastric and Duodenal Ulcer." Questions answered by Doctors F. A. Weiser and W. A. Chipman.

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MAY, 1943

NUMBER 5

Toxic Effects of Chemotherapy*

By John A. Toomey, M.D.

Cleveland, Ohio



A.B., John Carroll University, 1910; A.M., 1912; LL.B., Cleveland Law School, 1913; M.D., Western Reserve University, 1919. Professor, Clinical Pediatrics and Contagious Diseases, Western Reserve University; Physician-in-Charge, Division of Contagious Diseases, City Hospital; Associate Pediatrician, University Hospitals. Fellow, American College of Physicians, American Academy of Pediatrics, American Public Health Association and member of numerous scientific organizations.

A consideration of the subject of chemotherapy from the standpoint of the acute infectious diseases of childhood; the results of chemotherapy in the various types of meningitis, poliomyelitis, sinusitis, complications of measles, scarlet fever, acute pyelitis, gastrointestinal diseases, pneumonia, acute bacterial endocarditis, streptococcus sore throat, ordinary colds, etc.; and the type of dye to be used will be made. In doing this, it will be pointed out that sulfathiazole and sulfadiazine may be much more dangerous drugs than is ordinarily thought and that while the earlier drugs have greater objective symptoms, the newer ones produce complications that are hidden. These come on suddenly and are more serious than those following the administration of the earlier dyes. Particular reference will be given to the role of the kidney in the use of dyes.

■ FOR my contribution to this symposium, I thought it best to consider the toxic effects of the various chemotherapeutic drugs, to stress those conditions for which one should be on guard when using these drugs in acute infections and briefly to review the conditions for which these drugs are indicated.

It must be considered axiomatic that chemotherapy should be used with a great deal of caution; that it should not be used except for some good reason; that it should not be used for every ill that the human race falls heir to; and that the disease for which it is used must be one for

which one of the drugs is indicated. Should they be used promiscuously, patients may become sensitized and when at a later date chemotherapy is urgently necessary, we may not be able to use one of these life-saving drugs.

Another axiom must be remembered. Use enough of the selected drug over as brief a period of time as possible and discontinue its use promptly. In short, "get in and get out." It is not a good policy, in private practice at least, to give small amounts of dye over a long period of time; in fact, there are only a few diseases like subacute bacterial endocarditis which may be treated with small amounts and possibly do any good. Such patients must be under constant observation. In any other condition, even including gonorrhea, it is my impression that the results are apparent soon or not at all.

Another axiom may be coined, that is, if the drug does not produce any beneficial effect in the patient within twenty-four to forty-eight hours, it is time to change the therapy.

It must be realized that these drugs are not substitutes for surgery and that frequently better results are obtained if a drug is used in combination with specific antiserums.

Chemotherapy is contra-indicated in the treatment of poliomyelitis and lymphocytic choriomeningitis. There is no evidence that it will effect any virus infection other than inclusion blenorhoea, for which it is nearly specific, and possibly trachoma. Monkeys given chemotherapy and then poliomyelitis virus will develop a more severe form of the disease sooner than those not given any drug. There are reports in the literature wherein diseases like poliomyelitis have been treated with Neoprontosil. This drug has no beneficial effect on this disease.

If an individual has had chemotherapy before you treat him, you must remember that he might

*Read at the Seventy-seventh Annual Meeting of the Michigan State Medical Society, at Grand Rapids, September 23, 1942.

TOXIC EFFECTS OF CHEMOTHERAPY—TOOMEY

have become sensitized, and subsequent chemotherapy must be given with caution, starting out with small doses; otherwise, you may get a marked reaction.

There are several kinds of chemotherapeutic drugs on the market. Each particular drug is introduced on the basis that it causes fewer reactions, can be given more easily, and is less toxic than some previously introduced drug.

The American Medical Association has never accepted Neoprontosil. However, when other drugs cannot be taken, this drug has been recommended. It has also been recommended for the few conditions where drugs have to be given over a long period of time, and by some of the members of the Mayo Clinic, in gastro-intestinal infections.

Sulfamethylthiazole has been taken off the market because its use was followed by too many neurologic complications.

Promin, although a drug equally as good as sulfanilamide for treating streptococci, has not been pushed by its advocates and is still an experimental product. The recent work with this drug in tuberculous infections of guinea pigs is interesting, but not conclusive.

I need not consider sulfasuxidine because it is too early to draw conclusions about a drug so recently introduced. It is not quite definite yet that this drug is any better than sulfaguanidine. Nor need we pay too much attention to sulfabenamide, penicillin or gramicidin for like reasons.

By exclusion, the remaining drugs are: sulfanilamide, sulfapyridine, sulfathiazole, sulfadiazine and sulfaguanidine. Many physicians abhor the use of sulfanilamide and sulfapyridine and prefer to use sulfathiazole or sulfadiazine. They don't like to use the two former drugs because of the visible reactions and obvious complications. On the contrary, I feel that this is an advantage for if a physician learns to use sulfanilamide intelligently, he knows immediately what dangers he is encountering merely by looking at the patient and by checking the urine. Usually a glance at the patient will suffice. The complications are obvious. The same is true of sulfapyridine, but how different is it with sulfadiazine and sulfathiazole! We are told how these drugs lack toxicity; how they produce no visible side effects. The latter statement is true, but the invisible effects of these drugs which come on insidiously and surreptitiously may far overshadow the severity

of any of the reactions which follow the use of sulfanilamide. With sulfanilamide and sulfapyridine, you may get crystallization, perhaps ureoliths in the ureters, or perhaps a muddy urine in the pelvis of the kidneys. With sulfathiazole and sulfadiazine, a "frozen kidney" may result, i.e., the tubules will be blocked. They appear as though concrete were poured along the passages. The first inkling you have of anything serious is when the patient may have a convulsion or anorexia or vomiting, the secondary signs of kidney disease.

If these latter drugs are used, the blood-urea-nitrogen level should be taken on the third or fourth day if the patient has been treated massively and on every other day thereafter. This is much more important than even examining the urine because the blood-urea-nitrogen level may be increased, azotemia may develop, and the patient may go into convulsions and a uremic state with scant evidence in the urine of any serious nature—certainly not with the gross blood that you repeatedly see with sulfanilamide and sulfapyridine irritations. These drugs, I feel, are dangerous drugs. You must remember that merely because the patient looks well and feels well, it does not mean that he will continue well.

It is very important that the patient get enough fluid. If he takes enough of this, most of the kidney complications may be averted. The patient receiving massive amounts of the drug should be given at least 2,000 to 3,000 c.c. of fluid a day in one way or another; and there should be some relation between the intake and output.

One need not worry about giving other drugs with sulfanilamide, although it is usually avoided. Certainly, however, there is good reason to give alkalies like sodium bicarbonate.

Slides

With sulfanilamide or sulfapyridine, these lesions of the ureters may be as shown in the slide where the ureter is dilated with ureoliths. If you notice that your patient passes a muddy urine and if this muddy debris settles at the bottom of the test tube, investigate the possibilities of latent trouble due to kidney blockage. The next kidney shown here was taken from a monkey which also shows marked dilatation of the ureters secondary to drug therapy. In the next slide, you see the actual size of these stones themselves.

Reactions seen in the next patient shown represent reactions to too much sulfonamide therapy. He had taken over 745 grains in fourteen days. He developed fever and became sensitized.

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A second patient had 500 grains of the drug and began to have a slow rising temperature on the seventh day, which did not fall until the eleventh or twelfth day afterwards, an intermittent temperature reaction.

The third patient, a physician, had chronic sinusitis and had taken 330 grains of drug over a period of eight days and was sent into the hospital with a typical scarlatiniform eruption. His temperature went down in three days. On the eighth day, he ingested only five grains of sulfanilamide and within a half hour his temperature had gone from normal to nearly 40° C.—a typical sensitivity reaction, and his subjective discomfort was very severe. Sometimes this sensitivity is not appreciated. One may not be aware that a low grade type of temperature curve may be due to the drug.

The temperature curve in a white female with acute puerperal endometritis swung from 98° F. to over 104° F. daily until the sulfonamides were discontinued. Just as soon as they were started again, the temperature rose.

The anemias caused by sulfonamides are either chronic or acute. Chronic anemia is fairly common. Practically every individual treated with the sulfonamides, especially sulfanilamide, will have some slight degree of hemoglobin decrease. This chronic type of anemia is slow in developing and mild in character; the white blood cells are normal in amount and type, and there is no fever. About 3 per cent of the cases, however, develop fairly severe anemia and the red blood cell count may swing rapidly up and down. There may be a relatively high white blood cell count and some fever.

A complication which is very serious is hepatitis. Here are summaries of the histories of five patients. Their ages were 24, 25, 28, 40 and 41 years and they received 26, 35, 35, 50 and 60 grams of sulfanilamide, respectively. The findings were: an enlarged liver, moderate icterus, 4 plus bile in the urine, an exfoliating dermatitis three times and an ascites once. Fortunately, all but one patient recovered when the drug was stopped.

Next is a three-weeks-old child with pneumococcus meningitis and otitis media. There were 7,000 cells in the spinal fluid, 70 per cent of which were leukocytes. The patient seemed almost moribund at the start of therapy. He weighed only 3,220 grams and yet we gave large amounts of sulfapyridine, at least one gram daily for nine days. The temperature dropped within three or four days; the blood-urea-nitrogen level on the second hospital day was 11.5 and the sulfapyridine level 20 mg. per cent. By the fourth hospital day, there were only 840 cells in the spinal fluid. The next day the

blood-urea-nitrogen level was 9.6. The patient refused to eat beginning on the ninth hospital day and the temperature rose. The blood-urea-nitrogen level at that time was 15.4. The urine was bloody and crystals were present, as well as a curious reversal of the leukocyte-lymphocyte ratio of the blood stream, a white blood cell count of 26,000 with a leukocyte count of 16 per cent, lymphocytes 77, the blood-urea-nitrogen level going as high as 23.9 per cent. On the fourth day after the drug was discontinued, the blood-urea-nitrogen started to come down and the leukocyte-lymphocyte ratio began to change. This infant illustrates all of the reactions one would expect to find—anorexia, fever, urinary findings, changes in the blood-urea-nitrogen level and the reversal of the leukocyte-lymphocyte ratio of the blood stream which appear when the ureters become blocked.

The next slide depicts a diffuse maculopapular eruption which may appear as a result of drug sensitivity. When these drugs are given experimentally, they produce skin lesions.

One may get into a dilemma in treating a serious infection. The patient may have an influenzal meningitis that has to be treated over a long period of time and this infection is often associated with relapses. If the patient develops a sensitivity, i.e., a skin rash or obvious blood changes, there is nothing to be done except to change the therapy. If, however, the patient merely develops blockage of the ureters and tubules without signs of any sensitivity and without signs that the drug has caused any damage other than mechanical, the urinary pathways can be cleaned out directly by catheter or indirectly by giving large amounts of water internally or by infusion; after this is done and the temperature has come down, one can start treatment again with the same drug. I have seen the kidneys blocked two or three times when treating influenzal meningitis. Where you have a drug that is efficient, and are treating an individual who has a disease that will kill him unless treated, then one is justified in washing out the kidney and in trying to get rid of the drug, and promptly proceed in giving it again.

If an individual who is taking a certain drug becomes sensitized, the physician is in a predicament. His future course may depend upon the drug just used. If the patient becomes sensitive to sulfanilamide, usually he will not be sensitive to either sulfathiazole or sulfadiazine, and vice versa. But occasionally a patient seems to be group sensitive to the sulfonamide radical itself, or at least he is sensitive to practically all drugs as can be seen from the slide shown.

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This slide represents an individual who became sensitive. When first admitted to the hospital in August, he had a sulfathiazole eruption. The drug was discontinued. Later when the temperature became normal, it was started again and he had another marked rise in temperature. It promptly fell when the drug was dropped, only to rise again when the same drug was given a few days later. Two trials of sulfanilamide did not cause any reaction, but small amounts of sulfadiazine and sulfapyridine (0.25 gm.) caused definite reaction.

Complications

Eruptions may be directly due to a toxic effect they produce in the patient, causing a severe erythematous maculopapulated generalized eruption, sometimes bullous in type. This toxic effect is rarely seen and only after large doses; subsequent moderate doses cause no reactions.

A purely allergic effect with urticaria, pruritis, sneezing, dyspnea, et cetera, might result if the patient had a reaction after the first dose of the drug, even with the smallest amount possible. It is stated that in such an instance the drug acts like a haptene. Subsequent doses cause the same effect.

A third and most common type of reaction is the so-called allergo-toxic effect, which follows moderate doses approximately seven to fourteen days after the medicine is first given. This eruption simulates some of the contagious diseases in that it may be either a maculopapular or morbilliform type of eruption, like measles and scarlet fever, a type of eruption which reappears if the drug is again given after the original rash has faded.

It is not clear to me how this drug can cause a direct toxic effect as mentioned previously; nor, have I seen any purely allergic type of reaction. Usually our patients have taken some sulfa drug previously.

The allergo-toxic type of effect is common. Such patients, who have had one of the sulfa drugs and who have previously developed a typical allergo-toxic reaction with all the side effects that go with it, may have an immediate reaction within a very few minutes to a few hours after the subsequent ingestion of a small amount of the same drug.

If the mild toxic effects of the sulfonamides are present, one can continue the use of the drug. One does not worry too much about malaise, vertigo, headache, buzzing of the ears, loss of appetite or even nausea; cyanosis fol-

lowing sulfanilamide is so common that it does not require much comment.

When, however, there are moderately severe toxic effects of the sulfonamides, one has to exercise some vigilance or even reduce the dose, i.e., where there is itching of the skin, abdominal pain, deep cyanosis, persistent vomiting and especially diarrhea.

Naturally, the drug must be discontinued if severe toxic effects or sulfanilamide demonstrate themselves, such as fever, dermatitis, anemia of any kind, leukopenia and jaundice. I am, of course, referring to the leukopenia due to the drug. Patients may have leukopenia, and although they do not necessarily respond to a drug per se, the drug may combat the secondary infection which accompanies these conditions. When the patient exhibits toxic manifestations to any of the sulfonamide drugs, one must stop its use at once, force fluids and transfuse.

Treatment

Many other recommendations have been offered, but none of them are necessary if the three previous admonitions are followed. Such things as pentnucleotides, oxygen, methylene blue, glucose and insulin are used but are unnecessary. The physician who is on the alert never wants to get to the stage where he has to treat a patient for toxicity resulting from the drug. He will observe his patient closely, examine the blood daily after the second or third day, get the blood-urea-nitrogen level after the fourth day and watch the patient for jaundice. I have had good results when I have used a dye carefully where the liver damage has been secondary to scarlet fever infections. We avoid its use in leukopenia due to the drug. I also avoid its use in anemia.

Whenever sulfaguanidine is used for a long period of time, destruction of the resident colon bacillus in the gastro-intestinal tract occurs, as a consequence of which there may be some disturbance of vitamin function. It is felt that if the drug is to be given over a long period of time, it should be accompanied by the use of vitamin B plus vitamin K.

Toxic Factors

We should know something about the early toxic factors of the drug, so that we will be able to recognize toxic factors early. What are these toxic factors? In the gastro-intestinal tract and

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its associated organs, one may have nausea, vomiting, hepatitis, stomatitis and diarrhea; in the urinary system, crystals, hematuria, anuria or azotemia; in the central nervous system, there may be mental and neurologic changes with dizziness, psychoses and the sight and hearing may become affected; or reactions in the skin and mucous membranes may occur, such as jaundice, cyanosis, dermatitis, conjunctivitis, purpuric spots, agranulocytic lesions; or blood conditions, such as agranulocytosis, acute hemolytic anemia, mild hemolytic anemia, leukopenia with granulocytopenia or leukocytosis with acute anemia; or general effects, such as fever, acidosis or joint disturbances.

With regard to the individual drugs, one may summarize these toxic conditions. So far as the gastro-intestinal system and accessory organs are concerned, reactions follow the use of sulfanilamide, sulfapyridine and sulfaguanidine. Sulfathiazole and sulfadiazine do not seem to produce many such reactions. In the skin, sulfathiazole is the great offender and perhaps sulfanilamide next. All the other drugs may give reactions. As far as general reactions are concerned, such as fever, sulfanilamide and sulfathiazole are common offenders. Sulfanilamide and sulfapyridine are more apt to cause anemias. In the genito-urinary system, sulfanilamide and sulfapyridine are apt to cause reactions and the formation of stones of the urinary tract, pelvis and kidney. Much more serious than this, in my opinion, is the fact that sulfadiazine and sulfathiazole may cause the formation of a frozen kidney, in which the tubules are blocked. Finally, involvements of the nervous and mental system may follow. They seem more common with the use of sulfanilamide and sulfapyridine.

Certain drugs are recommended for certain conditions; adenitis usually caused by streptococcus—sulfanilamide, sulfathiazole or sulfadiazine is recommended; bacteremia—any one of the drugs, dependent upon the type; dysentery is treated with sulfaguanidine; epidemic sore throats—either sulfathiazole or sulfanilamide. I still treat erysipelas with sulfanilamide. Many physicians have treated kidney infections with sulfathiazole. Lymphogranuloma has been treated with sulfadiazine; mastoiditis and meningitis, depending on the cause, have been treated with any one of the drugs. Sulfathiazole is not used in meningitis. This drug is not absorbed freely

into the cerebrospinal circulation, although it has been stated that experimentally the drug is absorbed when there is an infection; osteomyelitis—probably sulfadiazine; otitis media—again most any one of the dyes; pneumonia—sulfapyridine and sulfadiazine, usually sulfathiazole in infants; acute rhinitis of virus etiology is not to be treated; suppurative adenitis—either sulfanilamide, sulfathiazole or sulfadiazine. Specifically, sulfaguanidine acts best in *B. coli* infections and likewise in dysentery, although there have been some reports of the good effects of sulfathiazole against these organisms. If it were to be used in typhoid, perhaps sulfaguanidine is the one to use. Sulfanilamide is efficacious against *B. Welchii*; sulfadiazine, Friedlander's bacilli; sulfathiazole, gonococcus; sulfanilamide or sulfadiazine, influenzal meningitis; sulfadiazine or sulfanilamide, meningococcus; sulfapyridine or sulfadiazine, pneumococcus; sulfathiazole or sulfadiazine, staphylococcus; sulfanilamide or sulfadiazine, streptococcus hemolyticus.

It is my personal opinion that we could probably practice medicine with just three dyes—sulfanilamide, sulfadiazine and sulfaguanidine. The probabilities are, however, that pediatricians will insist on using sulfathiazole since they feel that children tolerate it well and do not have marked gastro-intestinal symptoms. I feel that sulfadiazine is just as good. We reserve sulfapyridine for those patients who do not respond to other forms of therapy.

It is felt that if we learn how to use these drugs just mentioned, our patients would receive all of the advantages that can possibly be obtained from any chemotherapeutic drug thus far described in the literature.

M SMS

The local injection of 20 c.c. of novacain will often give dramatic relief in acute subdeltoid bursitis.

* * *

While treating patients having colles fractures, have them place their hand behind the neck twice every hour so as to exercise the shoulder.

* * *

Gout is the most common cause of acute postoperative arthritis.

* * *

The treatment of club feet should be instituted within a few days after birth.

—EUGENE W. SECORD, M.D., Detroit

Sulfonamide Therapy in General Practice*

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During the past seven years, the value of administering the sulfonamides in the prevention and treatment of a variety of infections has been recognized. To obtain maximum success with these drugs it is necessary to have an understanding of certain principles inherent in this type of chemotherapy. In this discussion emphasis will be placed upon presentation of the following factors responsible for the successful use of sulfanilamide and its derivatives in general practice.

1. Proper Selection of Drug
2. Early Treatment
3. Adequate Dosage
4. Detection of Drug Toxicity
5. Employment of Other Therapeutic Measures

THE chemical treatment of bacterial disease was reopened with the discovery of the effectiveness of the sulfonamide group of drugs. Numerous clinical studies have established the therapeutic value of the sulfonamides in many types of infections, some of which, until these drugs were introduced, had been almost uniformly fatal. To obtain maximum success with the sulfonamide drugs, it is important to have an understanding of the factors which make for success or failure in the treatment of different types of infection. The purpose of this paper, therefore, is to discuss some of the more important basic principles inherent in this type of chemotherapy. Although no two cases are identical in all their detail, the following discussion of the factors responsible for successful sulfonamide therapy may be applied in general to all types of infections. For the most part, only those drugs which have been accepted as being effective in the control of various bacterial diseases will be considered.

Proper Selection of Drug

The proper selection of drug to be employed in a given infection depends largely upon three fac-

tors, namely: (1) the drug must possess maximum antibacterial action against the offending organism; (2) the drug must be capable of reaching the region of the infection in effective concentration, and (3) the drug should be the least toxic and at the same time satisfy the first two criteria.

1. Antibacterial Activity of the Sulfonamides.

From clinical trial with these compounds, we have learned that certain bacteria are more sensitive than others to the various members of this group. It is important, therefore, to know which drug is likely to be the most effective against a given infectious agent. A number of sulfonamide drugs have been shown to possess a high degree of antibacterial activity against many kinds of experimental infections, but because of their behavior and toxicity in man, only a few of these compounds are of clinical usefulness. Hence, we will first consider their clinical pharmacological and toxicological properties.

2. Pharmacology.—The intelligent use of these drugs demands an understanding of the factors concerned with their absorption by, distribution in, and excretion from, the body. With the exception of sulfanilamide, these compounds are quite insoluble in water, although they attain greater solubility in body fluids. The drug concentration reached locally and in the blood is dependent both on the rate of entry into and the rate of exit from the local area and the circulating blood. The rational basis for the local application of the sulfonamides is the higher concentration obtained locally and, because of the relatively greater solubility of sulfanilamide in wound fluids, its use locally has thus far proved to be the most satisfactory. However, the limited solubility of sulfapyridine, sulfathiazole, and sulfadiazine is partially balanced by the fact that these drugs remain in the wound longer than does sulfanilamide. When administered by mouth, all of these drugs are nearly completely absorbed from the intestinal tract into the blood stream within two to four hours after the ingestion of moderate (3 gm.) doses. After the fourth hour the amount of drug in the circulating blood, with the exception of sulfadiazine, diminishes rapidly. Therefore, in order to attain and maintain adequate blood concentration of these drugs, it is necessary to administer a large initial dose, followed by smaller amounts of the drug at four-hour intervals, day and night. Ob-

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viously, when the drugs are employed parenterally, high blood levels are obtained more rapidly than when they are administered locally or by mouth.

urea in their uniform distribution throughout the body, as, after they pass into the blood stream, they diffuse readily into the various body tissues and fluids. The drug concentration in

TABLE I. TOXIC MANIFESTATIONS OF THE SULFONAMIDES

Reaction	Sulfanilamide	Sulfapyridine	Sulfathiazole	Sulfadiazine
Dizziness	Common	Common	Uncommon	Uncommon
Cyanosis	Common	Common	Uncommon	Uncommon
Nausea, Vomiting	30 per cent	60 per cent	18 per cent	4 per cent
Fever	9 per cent	3 per cent	5 per cent	3 per cent
Dermatitis	2 per cent	2 per cent	4 per cent	1 per cent
Conjunctivitis	Not seen	Not seen	2 per cent	Not seen
Episcleritis	Not seen	Not seen	Not seen	Rare
Psychosis	1 per cent	4 per cent	3 per cent	4 per cent
Hematuria {	Microscopic	Not seen	10 per cent	8 per cent
	Gross	Not seen	1 per cent	0.7 per cent
Renal Calculi	Not seen	0.5 per cent	0.3 per cent	Rare
Anuria	Not seen	0.4 per cent	0.5 per cent	Rare
Neutropenia	1.0 per cent	2 per cent	2 per cent	1.5 per cent
Agranulocytosis	Rare	Rare	Reported	Reported
Acute hemolytic anemia	1.2 per cent	1 per cent	Very rare	Rare
Mild anemia	4 per cent	2 per cent	Uncommon	Uncommon
Hepatitis	Rare	Very rare	Very rare	Not seen
Neuritis	Rare	Very rare	Very rare	Not seen

Following their absorption into the blood stream, the sulfonamides are partially conjugated by the liver into the acetylated or conjugated forms. Since the acetylated derivatives of the sulfonamides are therapeutically inactive, and tend at the same time to be more toxic, a high degree of acetylation is therefore distinctly disadvantageous. In general, approximately 20 per cent of sulfanilamide, 30 per cent of sulfathiazole, and 15 per cent of sulfadiazine appear in the circulating blood as acetylated compounds. Because of the irregular conjugation of sulfapyridine, varying from 10 to 90 per cent, it is impossible to predict the amount of acetyl sulfapyridine present, although the average is about 30 per cent of the total drug. Thus, the usefulness of sulfapyridine has been limited because of its irregular and, at times, high degree of acetylation.

The sulfonamides resemble the behavior of

tissues varies in relation to its vascularity, so that diffusion into areas of chronic infection, bone and necrotic tissue may be deficient. All of these drugs are present in exudates and transudates in concentrations equal or higher than those found in the blood. With the exception of sulfathiazole, they pass readily into the cerebrospinal fluid in concentrations averaging 50 to 65 per cent of that present in the blood. Because of the relatively low concentration of sulfathiazole attained in the cerebrospinal fluids, about 20 per cent of the blood level, its use in meningeal infections has been limited. The low concentration of sulfathiazole in the spinal fluid is not necessarily of great consequence, as it is the existence of antibacterial concentrations of drug in sub-meningeal tissues, curtailing bacterial invasion, which probably limits the spread of the process as much as the drug in the spinal fluid itself. It is, nevertheless, desirable to have a bac-

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TABLE II. SELECTION OF DRUGS

Infection due to	Drug of Choice
Pneumococcus	Sulfadiazine
Meningococcus	Sulfadiazine
Bacillus mucosus capsulatus	Sulfadiazine
Streptococcus viridans	Sulfadiazine
Streptococcus hemolyticus	Sulfanilamide or Sulfadiazine
Streptococcus fecalis	Sulfathiazole or Sulfadiazine
Staphylococcus	Sulfathiazole or Sulfadiazine
Gonococcus	Sulfathiazole or Sulfadiazine
Escherichia coli	Sulfathiazole or Sulfadiazine
Bacillus proteus	Sulfathiazole or Sulfadiazine
Aerobacter aerogenes	Sulfathiazole or Sulfadiazine
Bacillus pyocyanus	Sulfathiazole or Sulfadiazine
Hemophilus influenzae	Sulfathiazole or Sulfadiazine
Bacillus dysenteriae	Sulfaguanidine or Sulfathiazole

teriostatic concentration of drug in the spinal fluid, and, for this reason, sulfathiazole is not recommended for the treatment of meningitis, although good results have been obtained with its use in such infections. These compounds, with the exception of sulfathiazole, readily penetrate the red blood cells. This is perhaps of clinical importance as far as the development of hemolytic anemia is concerned.

The sulfonamide drugs, regardless of their route of administration, are excreted mostly in the urine, both in free and acetylated form, and, with the exception of sulfadiazine, excretion of a single dose is almost complete within twenty-four hours. Only small quantities are excreted in the tears, breast milk, sweat, saliva, or stools. Their excretion by the kidneys is similar to that of urea, but reabsorption by the tubules occurs to a greater extent, and their elimination is reduced in the presence of kidney damage. However, the clearance of these drugs is definitely increased by an increased rate of flow of urine and this is best obtained by forcing fluids, either by mouth or, if necessary, parenterally. With a decrease in kidney function an increase in drug concentration in the blood occurs, especially of the acetyl fraction. Therefore, should the volume of urine become low, the possibility of stone formation in the urinary tract by precipitation of crystals of the acetyl compounds, except acetylsulfanilamide, is greatly increased. Hence, it is extremely important, in order to facilitate the excretion of the acetyl derivatives by the kidneys, to maintain a urinary output of at least 1200 c.c. daily.

3. *Toxicology*.—In Table I is shown the incidence of the more common toxic manifestations observed in patients receiving the sulfonamides.

Although sulfadiazine has not been used as extensively as the other members of this group, there are sufficient data now available which lead us to believe that it is the least toxic of these drugs.

On the basis of the above criteria, the following recommendations regarding the proper selection of drugs in a given infection are made (Table II). No doubt, with the rapid developments of chemotherapy, some of these recommendations will soon be subject to change.

Early Treatment

Experience with these drugs in many kinds of bacterial disease has shown that the length of time that elapses between the onset of the infection and the beginning of sulfonamide therapy represents the most important single controllable factor in the prognosis of the disease. The best results, therefore, with the sulfonamides are obtained when they are administered early in the infection, while the number of bacteria is still limited and the extent of tissue breakdown is at a minimum. Although it is important to make a bacteriological diagnosis in each case, it is usually expedient to start chemotherapy on the basis of the clinical picture alone, without waiting for the laboratory findings. This does not mean, however, that the necessary bacteriological studies are to be neglected, as every effort should be made to determine the causative agent. Not only is this of importance for the proper selection of drugs to be employed, but also in those cases where additional therapeutic measures are necessary, such as the use of specific serum, this knowledge is indispensable.

Adequate Chemotherapy

To obtain maximum therapeutic results with the sulfonamides, it is necessary to administer the drug in such a manner as to attain effective concentration of the drug in the circulating blood and/or at the site of the infection, and to maintain the same until the patient has developed sufficient immunity against the infection to prevent a relapse. Thus, adequate chemotherapy largely depends on: (1) the methods used in administering the drug, and (2) the scheme of dosage employed.

1. *Methods of Administration*.—In general, the oral administration of the sulfonamides has proved to be the most satisfactory method in the

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treatment of acute systemic infections. However, in certain instances where a rapid elevation of the blood level of the drug is desired, or where oral medication is impracticable or impossible, it is often necessary to resort to parenteral administration. In such cases, sulfanilamide, because of its relatively higher degree of solubility in water, can be given subcutaneously or intravenously as an 0.8 per cent solution in sterile physiological saline. The best results with sulfanilamide parenterally are obtained with the subcutaneous route, by virtue of a more uniform absorption into the circulating blood. In order to administer sulfapyridine, sulfathiazole, or sulfadiazine parenterally, it is necessary, because of their physical properties, to employ the sodium salt of these drugs. It is advisable to give these compounds intravenously as a 5.0 per cent solution in sterile distilled water. Because of the slower excretion of sulfadiazine, its use by vein has given more satisfactory results than has the sodium salts of sulfapyridine or sulfathiazole. All of these drugs may be used locally and, as mentioned above, sulfanilamide has yielded the best results, as the limited solubility of sulfapyridine, sulfathiazole, and sulfadiazine give rise to lower drug concentration. However, they do have a wider range of action than sulfanilamide and also remain longer in the wound.

2. *Dosage.*—In discussing the dosage of these drugs, it is well to point out several factors which tend to influence the amount of drug that is necessary to obtain the desired therapeutic results. The infecting organism, both as to its susceptibility to the drug and as to the severity and type of lesion which it produces, must be considered. Acute conditions, involving soft tissues, require different dosages than do chronic established infections or urinary tract disturbances. Moreover, certain other factors, such as kidney function, drug absorption, and the state of dehydration all influence the amount of drug found in the blood. It becomes apparent, therefore, that it is impossible to outline a course of sulfonamide therapy which will suit the needs of every patient. However, once drug treatment has been started, it is important to continue the drug until complete clinical cure is obtained. Not infrequently, a fall in temperature proves deceptive, and a spread or recurrence in the infection will occur if treatment is stopped too early. Chemotherapy should be continued until

the patient has developed sufficient immunity against the infection to prevent a relapse, although the time required for the development of an immunity varies with individual patients and infections. A safe procedure to follow when in doubt, is to reduce the dose gradually over a period of days and watch the patient carefully for any evidence of recurrent infection. Not infrequently an infectious process will be masked by the action of these drugs and, after chemotherapy has been discontinued, the signs and symptoms of the infection will manifest themselves. Theoretically, all patients treated with the sulfonamides should be followed by frequent estimation of the concentration of the drug in the blood. However, experience with these drugs, with the exception of sulfanilamide, has failed to show any consistent correlation between therapeutic effectiveness and the blood level of free drug. Furthermore, in many instances in which these drugs are used, facilities for determining their concentration in blood will be lacking. Therefore, it seems reasonable for practical purposes to administer the approximate amount of drug which experience indicates will probably be therapeutically effective. In general, the following recommendations on dosage are for the treatment of adults suffering with acute infections requiring full amounts of the drug.

Sulfanilamide.—A blood concentration of free sulfanilamide of 10 mg. per cent will give maximum therapeutic effectiveness in most types of infections susceptible to the drug. Higher concentrations (15 mg. per cent) are indicated in certain instances, such as meningeal infections. In general, adequate blood concentration of free drug can be accomplished by an initial dose of 3 to 5 gm. of sulfanilamide, followed by doses of 1.0 to 1.3 gm. every four hours day and night. The above dose schedule applies also to parenteral administration of sulfanilamide in 0.8 per cent solution by the subcutaneous route, although the rate of absorption by the tissues will influence the number of injections necessary. In general, it is necessary to give the drug every six to eight hours in order to maintain adequate blood levels of free drug. For local use, the amount of drug used will depend largely on the size of the area involved. A conservative dose provides 1 gm. for each 10 square inches of surface involved. When used in closed cavities, no more than 5 gm. should be instilled. At no

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time should more than 15 gm. be used locally, because the drug is absorbed rapidly and toxic reactions may develop.

Sulfapyridine and Sulfathiazole.—As mentioned above, the amount of free drug in the blood is of doubtful significance, although a level of above 5 mg. per cent should give maximum results except in certain cases, such as meningitis, where higher levels (10 to 15 mg. per cent) are desirable. The usual dosage by mouth for sulfapyridine and sulfathiazole is an initial dose of 3 to 4 gm. followed by 1 gm. every 4 hours day and night. For intravenous use with the sodium salt of these drugs, the initial dosage is 3 to 4 gm., followed by 2 gm. at 6-hour intervals. The local use of these drugs is the same as with sulfanilamide, but, as noted previously, their relative insolubility probably limits their effectiveness.

Sulfadiazine.—Although we have been unable to determine any definite correlation between the effectiveness of sulfadiazine and the concentration of free drug in the blood, it appears that if a free blood level of 5 to 10 mg. per cent is maintained, satisfactory results may be expected in most types of infection. Usually, this level can be realized by administering an initial 3 to 4 gm. dose of the drug by mouth, followed by 1 gm. every six hours thereafter. It is possible, in most cases, to adhere to this six-hour dose schedule, but occasionally, when a higher blood level of drug is desired, the 1 gm. dose is given at four-hour intervals. Furthermore, because of the behavior of sulfadiazine, the intravenous use of its sodium salt is more easily controlled and it is possible to employ the same dosage as with sodium sulfapyridine and sodium sulfathiazole, but at twelve-hour intervals. Employ sulfadiazine locally as mentioned above with the other drugs. In general, the doses of sulfathiazole and sulfadiazine used to treat urinary infections have been lower than those used to treat other conditions. For most types of infection involving the urinary tract treated with these drugs, urinary concentration of 50 to 200 mg. per 100 c.c. is usually sufficient to sterilize the urine, and such a level can be maintained by administering 2 to 3 gm. daily in divided doses.

Sulfaguanidine.—In addition to the drugs already discussed, there is still another sulfonamide compound, sulfaguanidine, worthy of comment.

This drug differs from the other members of the sulfanilamide group, in that it can be given by mouth in such doses that saturation of the intestinal contents occurs without producing levels of the drug in the blood higher than 4 mg. per cent. Because of the antibacterial activity and behavior of sulfaguanidine, it is useful in the treatment of infections mainly or entirely localized in the lumen of the intestine, such as bacillary dysentery. The drug is attended with comparatively few toxic effects, although drug rash, drug fever, conjunctivitis, and crystalluria are observed. The following dosage is employed in cases of bacillary dysentery: An initial dose by mouth, 0.1 gm. per kilo. of body weight, followed by 0.05 gm. per kilo. of body weight every four hours until the number of stools per day is five or less, then 0.05 gm. per kilo. of body weight every eight hours for seventy-two hours. Since practically all of the absorbed drug is excreted by the kidneys, the importance of maintaining an adequate urinary output is obvious. No doubt, sulfaguanidine or some other sulfonamide derivative having similar properties, such as sulfasuxidine, will prove effective in other types of intestinal infections.

Control of Drug Toxicity

As is the case with many other chemotherapeutic agents, the sulfonamides give rise to a variety of toxic manifestations (Table I), and in order to employ these drugs intelligently, one must be familiar with the potential dangers associated with their use. Fortunately, most of these toxic effects are not serious, and, if the patients are closely followed, the more severe reactions may be minimized. Furthermore, the incidence of severe toxicity is increased with their prolonged administration, but, since these compounds exert their maximum therapeutic effect within a comparatively short period of time, the necessity of continuing chemotherapy for longer than ten days is most unusual, except in certain types of infections.

In order to recognize and control these toxic reactions, the employment of certain clinical and laboratory procedures is essential. Skin rashes may occur at any time after the beginning of treatment, especially after the fifth day. In such cases it is best to stop chemotherapy, particularly if exfoliative dermatitis is present, although the drug may be continued with caution, if neces-

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sary. Drug fever is most commonly seen five to ten days after treatment has been started, but may occur at any time. Not infrequently it is difficult to determine whether the temperature rise represents a drug reaction or a recrudescence of the infection. Except in complicated cases, the fever of the original infection is usually normal by the third day of treatment and, if the patient is clinically improved, one should suspect a secondary rise in temperature as being due to the drug. Drug fever is often followed by dermatitis, hemolytic anemia, or neutropenia, and if it occurs, treatment should be stopped, unless the risk to the patient of continued infection seems greater than the risk of a severe drug reaction. As a rule, if the fever is due to the drug, it will drop within twenty-four to forty-eight hours, if the drug is discontinued and fluids forced.

With the exception of sulfanilamide, the toxic reactions involving the urinary tracts constitute the most important problem in this type of chemotherapy. The renal complications are due in part, if not entirely, to the presence in the urinary tract of crystals composed of the drugs, especially the acetyl portions. However, the presence of crystalluria alone does not indicate renal involvement, unless it is associated with progressive oliguria, hematuria, azotemia, or loin pain. Not infrequently, microscopic hematuria accompanies infectious diseases, and, unless a progressive number of red blood cells is detected, or other evidence of renal damage is apparent, cautious treatment may be continued, but it should be remembered that hematuria is often a precursor of severe renal insufficiency. Obviously, the appearance of gross hematuria, or any of the above kidney complications, are indications for stopping the drug and, at the same time, fluids should be forced, the urine alkalized, and hypertonic glucose solution administered intravenously to promote diuresis. Occasionally, ureteral catheterization is indicated, but should be employed only after other measures have failed. Since crystalluria from these drugs appears to be less frequent in an alkaline urine, it is advisable to administer alkalis in equal amounts to all patients receiving the sulfonamides, except in certain urinary tract infections, such as those due to the streptococcus fecalis in which an acid urine affords better therapeutic results. However, as mentioned above, the maintenance of a

urinary output of at least 1200 c.c. daily constitutes the most important factor in preventing the occurrence of severe renal complications.

Acute hemolytic anemia usually occurs during the first four days of treatment and requires cessation of chemotherapy and transfusion of citrated blood. Mild anemia of the hemolytic type is frequently seen and the drug may be continued, but should the hemoglobin fall below 60 per cent, transfusions are indicated. Depression of the white blood cells may occur at any time, although there have been no cases of agranulocytosis which developed within the first twelve days of treatment. It is best, therefore, to check the blood constituents every two to three days, especially in cases requiring the drug for longer than ten days. Nausea and vomiting are the most frequent toxic reactions from these drugs and should the vomiting become severe, it is advisable to check the serum chlorides.

Contra-indications to Sulfonamide Therapy

Theoretically, the only possible contra-indication to the use of the drugs is a history of a previous sensitivity to sulfanilamide, or one of its derivatives. However, in our experience, there have been a number of instances in which patients have developed toxic reactions to one member of this group of drugs and not to another, although this would not necessarily indicate that the patient would not have experienced an untoward reaction to the original drug. In such cases, with histories of previous sulfonamide toxicity, it has been our practice to administer chemotherapy at once and follow the patient very closely, rather than withhold drug treatment. The presence of anemia, jaundice, acute nephritis, leukopenia, or neutropenia *per se* does not contraindicate sulfonamide therapy, as these conditions will usually disappear as the infection is brought under control by adequate chemotherapy. Obviously, if such conditions are present, necessary measures should be taken to detect their further development. We know of no medication or food which cannot be given to patients receiving these drugs.

Employment of Other Therapeutic Measures

Regardless of the proven value of sulfonamide therapy, it is to be remembered that these drugs are not to be employed to the exclusion or neglect of other established therapeutic or supportive measures.

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1. Surgical Removal or Drainage of Primary Focus.—Clinically, it has been demonstrated that the sulfonamides exert their greatest effectiveness in diffuse lesions characterized by maximal tissue invasion and minimal tissue destruction. The presence of necrotic tissue or pus in a lesion prevents the drugs from acting upon bacteria with the same maximum effect which they exhibit in diffuse, non-suppurating infections. It appears, therefore, that their effectiveness in various conditions is determined chiefly by the situation of the infecting organism and the pathological character of the infected tissue. If bacteria are situated in a relatively poor medium for promoting growth, as blood or urine, the drugs are very effective. However, if the bacteria are situated in tissue medium, rich in products of tissue breakdown, which favors bacterial growth and inhibits sulfonamide action, the drugs seem clinically to accomplish little more than to protect unininvolved tissue. Hence, if tissue necrosis or pus formation is present, as in the case of pneumonia with empyema, meningitis with mastoiditis, or septicemia with osteomyelitis, the sulfonamides are not to be employed as substitutes for surgery, but may be used in hopes of preventing a spread in the infection. It follows, therefore, that the most important single factor in the successful handling of such cases is the location and removal or drainage of the focus of infection by proper surgical procedure. Furthermore, in the treatment of urinary tract infections every effort should be made to eliminate every possible cause of urinary stasis, in order to produce an adequately draining urinary tract, as no treatment is adequate until maximum drainage has been provided.

2. General Supportive Measures.—Close attention to, and the employment of appropriate measures for the correction of any disturbances in body fluids, electrolytes, blood constituents, vitamins, etc., constitute important factors in the successful handling of a patient suffering with infection. Furthermore, in cases failing to respond to sulfonamide therapy or those who are unable to tolerate the drug, the use of additional therapeutic agents, such as specific serum, is indicated.

Prophylactic Use of Sulfonamides

The usefulness of the sulfonamides as prophylactic agents is difficult to evaluate, as one can-

not be certain that infection has, or would have occurred. However, it seems reasonable that if these drugs are effective in the treatment of certain established infections, they might well be employed prophylactically in the prevention of such infections. Already there has appeared in the literature a number of reports which suggest that these drugs are of value in preventing infection following accidental or surgical insult to the body, such as burns, traumatic wounds, compound fractures, appendectomies, bowel resections, pulmonary lobectomies, nephrectomies, and transurethral prostatic resections. In view of the frequency with which subacute bacterial endocarditis follows the extraction of septic teeth, or the removal of infected tonsils, it seems advisable to give sulfadiazine to all patients with acquired or congenital heart disease in whom these operative procedures are contemplated. Although these drugs are definitely contra-indicated in cases of active rheumatic fever, they may be used to protect against the development of recurrent attacks after the acute stage of the disease has passed. Patients with chronic pulmonary disturbances, such as bronchitis and bronchiectasis, often develop severe pulmonary infection after operation and, in such cases, the drug may be given as a preventive measure. Furthermore, it is well to administer the drug in patients requiring frequent catheterization or cystoscopic examination, in order to minimize the febrile reaction which often follows these procedures.

Comment

The introduction of sulfanilamide and its related compounds into the field of chemotherapy has provided the practicing physician with an efficient weapon which, if properly employed, will result in a high percentage of cures. It is our belief that if the basic considerations discussed in this paper are recognized consistently, that constantly improving results will be obtained with the use of the sulfonamides in general practice. In general, the following represent the cardinal principles of successful sulfonamide therapy:

1. Proper selection of drug
2. Early treatment
3. Adequate chemotherapy
4. Control of drug toxicity
5. Employment of other therapeutic and supportive measures

Early Treatment of Compound Fractures*

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This paper summarizes the current thought concerning the therapy of fresh compound fractures. Its scope was planned to include all pertinent features of the therapy including the transportation of the patient.

The literature on this subject for the past five years was reviewed and the concepts therein found were correlated and presented. The work that has come out of the Spanish Civil War and the European phase of World War II was reviewed in so far as it was available in the American literature.

An effort has been made to evaluate the indications and efficacy of primary closure, internal fixation, débridement, and the Orr-Trueta method. Mention of the therapy and prevention of the complications of Tetanus and Gas Bacillus infections is included.

In summary fourteen points which in the author's opinion constitute a basis for the treatment of all fresh compound fractures are promulgated.

- THE major problems which present themselves in the treatment of compound fractures are:

1. Transportation of the injured from the point of injury or accident to whatever place the patient will receive care.
2. The cleansing or debridement of the compound wound itself.
3. The treatment of the fracture. The type of reduction and immobilization which will be used.
4. The use of chemical antiseptic or bactericides.

Unfortunately, the initial or primary treatment of the patient with a compound fracture is usually carried out by a lay person at the scene of accident, the policemen on a police ambulance, or the attendant on a private ambulance. Their motives are generally of the best, but their training is nearly routinely poor from a medical standpoint. Their actions seldom indicate that they have ever heard of the axiom, "Splint them where they lie."

*Read at the Blodgett Memorial Hospital Staff Meeting, January 6, 1942.

Unnecessary handling at the scene of the accident is to be condemned. All patients with suspected compound fractures should be treated as if the fracture exists. They should be splinted in any one of several manners and should be immediately taken to the nearest hospital or the nearest place where adequate medical attention can be administered. Every ambulance owner and every physician who is in a community where he is apt to be called upon to give emergency treatment for compound fractures should have available some type of splint which will be satisfactory for emergency immobilization. The Thomas leg splint and the Jones arm splint are undoubtedly the two most satisfactory appliances for this work. Pillow splints, aluminum posterior molds, and any available piece of wood which can be used to immobilize the joint above and below the fracture will serve if nothing else is available. The important point is that some type of splintage should be applied. No attempt at reduction of the fracture should be made at the scene of injury. An exposed fragment of bone should under no circumstances be reduced back into its soft tissue casing until such time as the soft tissues have been cleaned up and until the end of that bone has been cleaned. All that is accomplished by immediate reduction without cleansing it that whatever soiling there is on the surface of the wound and on the end of the compounded bone is carried into the depths of the wound and the débridement which must be done later is made that much more difficult. Local treatment should consist of splintage of the injured part, application of some type of clean, sterile if possible, dressing over the compound wound, and as rapid and painless transportation as possible to the nearest place where adequate surgical attention may be given to the patient's disability.

As soon as the patient is admitted to a hospital, he should be considered as an acute surgical emergency. This means that all departments in the hospital, i.e., the house staff, surgery, x-ray department, and the attending staff should respond to the patient's needs immediately. This point cannot be too strongly emphasized. The problem as it is generally accepted is that of a patient who has a fracture which will probably heal in three or four months provided the fracture does not become infected. If it becomes infected, the patient may have anywhere from a

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year to eighteen months' disability. If the fracture is adequately treated in its first six to eight hours, the chances are under modern treatment that it will not become infected. If, however, the first six or eight hours are dissipated in useless wastes of time in transportation, waiting for x-rays, waiting for surgery to set up, or waiting for the attending man to see the patient, then the patient is automatically condemned to a long, disabling convalescence which will necessitate, in all probability, multiple operations to treat the infection of the bone at the fracture site and possibly eventual dysfunction of the extremity as the result of faulty position, poor union, chronic osteomyelitis, or stiffened joints as a result of long immobilization.

Sera

Each patient with a compound fracture should have the usual 1500 unit dose of antitetanic serum. A test dose, either intracutaneous or conjunctival, should be used and the remainder then given either at once or in desensitizing amounts as indicated. There are no adequate means of predetermining the presence or absence of the tetanus bacillus in any wound. Since the results of the use of the serum are known to be adequate and since in civil practice the serum is readily available, there would seem to be no advantage in taking a chance by not giving the serum.

Gas bacillus anti-serum in prophylactic doses is a more debatable procedure. Some authors believe it should be routinely used. Other as competent writers believe it should never be used except in therapeutic doses and then only if a gas infection has developed. Others believe that the serum is of questionable value even in established infections and prefer to use oxygen, multiple incisions, sulfanilamide, and deep x-ray therapy as a treatment. Just which one or groups of methods is the best is difficult to decide. In view of the seriousness of the complication and the possible medico-legal complications if the use of the serum is avoided, it would seem to be logical to combine its prophylactic use in all wounds with soil contamination together with careful clinical watchfulness and more extensive care as indicated by the patient's progress.

Shock

As soon as the patient is admitted, an examination should be made which should include a check on the patient's pulse, blood pressure, res-

pirations, and a neurological examination to determine whether or not there is any evidence of concussion, subdural hematoma, or frank brain hemorrhage. If the patient is being treated in a hospital where modern laboratory facilities are available, an emergency hematocrit and plasma protein determination should be done. The results from these determinations can be delivered within a very short period of time and they will give the physician a more accurate index of the patient's condition relative to shock than a physical examination can possibly do. If the patient is frankly shocked, then that shock should be treated and it should be treated as an emergency in order that the patient may be given adequate surgical care for the compound wound as soon as possible. Too often we hear the statement, "The patient is in definite shock. Let's put him to bed tonight, treat the shock, and we will treat the fracture and the compound wound in the morning." This is poor surgical care. An effort should be made to combat the shock as rapidly as possible in order that the patient may have the wound débrided within the 6- to 8-hour deadline between contamination and infection. Morphia, warm blankets, shock blocks, whole blood transfusion, plasma, or intravenous fluids should be used immediately. The patient should be watched carefully, blood pressure should be checked, and as soon as he responds to the point where his condition is satisfactory, then the rest of the therapy may be carried out.

The treatment and diagnosis of surgical shock is now an accurate and quite clearly outlined entity. The efficacy of plasma, either whole or dried, and whole blood transfusions has been well established and the use of one or the other of these substances must be kept in mind. In a hospital where modern facilities are available, surgical shock should have adequate treatment. This must include the general measures listed above plus discriminating use of either whole blood or plasma and adrenal cortex extract. Accordingly, each patient who is suspected of being shocked should be routinely typed for possible future transfusion. If no donor is available and a blood bank is also not available, then commercially prepared plasma should be used. This is important because the prompt and efficacious treatment of the shock will permit early débridement and accordingly less infective complications.

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Blood and plasma are mentioned primarily because they are the two best therapeutic measures for shock. Other intravenous fluids may be used, but the permanence of their effects and the speed of their reactions are markedly inferior to either blood or plasma. Scudder and his group recommend adrenal cortex extract as an important and powerful adjunct.

Adequate x-rays are a necessity in civilian practice. Most civilian compound fractures are either street or industrial accidents, and as a result they are a potential medico-legal problem, and, in nearly all cases, are insurance problems. For this reason, if for no other reason, adequate pre-operative x-rays are a necessity. If the patient is not in shock, x-rays may be taken immediately; if the patient is in shock, this should be treated first and then the x-rays may be taken. As soon as this has been accomplished, the patient should be removed to the surgery and under a general anesthetic, cleansing and débridement of the wound, reduction of the fracture, and immobilization of the same should be carried out.

Anesthesia

The patient should have a general anesthetic. This is a debatable point. But in preparing this paper between 55 and 60 articles in the literature of the last three years have been investigated. The majority of men are agreed upon the fact that a general anesthetic is much preferable to a local anesthetic. Some of the articles were written by men who had had war experience either in England or in Spain. These men stressed the use of local anesthetic. They were, however, about the only ones who did suggest the use of local anesthetic in the treatment of compound fractures. The reason they stressed the local anesthetic was that general anesthesia of the type that is available in the civilian hospital was not available to them in their advanced clearing station. Furthermore, they did not have Hawley tables available and once the fractures were reduced and débrided they wished their patient to be as wide awake as possible so that the patient could assist by sitting up or adjusting his position as necessary for the application of the post-reduction plaster-of-Paris cast. Inasmuch as most of us do not have these mechanical problems presenting themselves in our civilian practice, we should use a general anesthetic, and the consensus of opinion in the literature at the

present time is in favor of débridement, reduction, and immobilization under general anesthesia.

As soon as the patient is satisfactorily anesthetized, all of the soiled and dirty clothing should be cut away from the affected extremity. The wound should be exposed and it should be covered with a clean, sterile gauze pad. The extremity should be shaved around the sterile gauze pad and then it should be washed, or, if you prefer, scrubbed with tincture of green soap and water. It should be scrubbed for at least ten minutes. Scrub sticks should not be used for this, but preferably the surgeon who is going to do the work should with his gloved hand and large cotton or gauze pledges vigorously scrub the extremity. It should be constantly irrigated with large quantities of either sterile water or sterile saline. Inasmuch as saline is a physiologic solution, it is probably preferable to distilled water. After the surrounding tissue has been adequately cleansed, the gauze dressing over the wound should be removed and the wound edges themselves should be cleaned up in the same manner as the surrounding skin. After this cleansing has been thoroughly accomplished, the skin is prepared with ether, iodine, and alcohol. Dr. Sumner Kock, Chicago, is a firm believer in the fact that adequate skin preparation with soap and water is all that is necessary. With the preparation accomplished the patient is draped in the usual manner and the débridement is carried out.

Débridement

There is considerable question at the present time as to just what constitutes adequate débridement. By definition, débridement means a removal of all of the dead, dying, and soiled tissues in a compound wound. This, according to the judgment of the attending surgeon, may include anything from a mutilating-type of operation to a very carefully done surgical preparation or cleansing of a compound wound. From the current literature the feeling at the present time is that as little tissue as possible should be removed but that sufficient tissue should be removed so that there is no dead, dying, or soiled tissue left in the wound.

In doing a débridement one must recognize the fact that this débriding procedure is not primarily to clean up the ragged skin edges but is principally to clean out all of the pockets of hemorrhage and devitalized muscle tissue and possible

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soiling that exists in the depths of the affected extremity. This is a most important point and one which is nearly routinely overlooked. If we recognize this point and attempt to carry out the procedure which is necessary to do this, then we will always enlarge the compounding wound and most particularly will we enlarge the small puncture compound wound which is formed from within out. Too often in this type of case do we see the wound treated locally with some anti-septic solution, a sterile dressing put on, reduction accomplished, and the leg or arm immobilized in a plaster-of-Paris cast. Because this procedure will occasionally give a satisfactory result without any secondary or complicating infection does not mean that it is a good or satisfactory surgical procedure. All compound fracture wounds regardless of their size should be débrided under general anesthetic. This means that all patients with a compound fracture should have a general anesthetic, that their compounding wound should be enlarged, and that a careful débridement should be done. This is the unanimous opinion of all men writing on the treatment of the early care of compound fractures. They do agree that occasionally a local procedure will be all that is necessary, but the additional trauma to the patient in whom this procedure is not necessary is so insignificant compared to the complication as a result of failing to débride a wound that does need it that there is no excuse for not débriding all compound wounds.

All small fragments of bone which have no periosteal attachments left should be removed. The best plan in the debridement is probably to excise the ragged, torn skin edges first. This does not mean massive excision of skin but rather does it mean that only the ragged edges should be removed, and no more than is necessary of the viable skin. Then working from the skin down to the depths of the wound, all of the contaminated muscle, fascia, and soft tissues should be excised. It is a good plan to have a constant stream of normal saline flowing into the wound from an elevated container all of the time because it helps to wash out the débris from the depths of the wound, and it further helps the operator to differentiate between injured and viable tissues. Bleeding points should be picked up with as small an amount of surrounding tissue as is possible, and the ligature should be 000 or

0000 catgut. Caution should be exercised in the débriding of the muscle. Very often there will be areas of intramuscular hemorrhage which to first examination appear to be areas of marked muscle damage. If the area is only one of simple intramuscular hemorrhage, it does not need débriding and will clear up in a few days without the necessity of removal. In questionable cases elevation of the part will often help in differentiation and the patient will be saved additional surgical trauma. It is definitely established that all buried catgut in compound wounds is a definite foreign body and as little of this should be left in the wound as possible. After the wound has been thoroughly cleaned, the bleeding points picked up and tied off, then the reduction of the fracture should be accomplished.

Closure of Wound

There are two very definite schools of thought concerning closure of the wound. Dr. Winett Orr of the United States and Dr. Jose Trueta of Spain are the two outstanding proponents of non-closure of the wound. Dr. J. Albert Key of St. Louis has written extensively concerning immediate closure of the compound wound following the débridement. With exceptions, the rest of the authors in the current literature prefer to either leave the wound open or close it primarily depending upon the particular problem that presents itself in any given case. Dr. Orr has for years advocated débridement, reduction of the fracture, packing of the compound wound with vaselinized gauze, and then immobilization of the extremity in a plaster-of-Paris cast, thus allowing the wound to have free drainage and permitting the wound to heal by granulation from its base to the skin surface. This work was given additional impetus by the work of Dr. Jose Trueta during the Spanish Civil War. Dr. Trueta treated several hundred cases of compound fractures with the method propounded by Dr. Orr, and his results, according to his writing, have been most satisfactory. Dr. Philip Wilson from New York Ruptured and Crippled Hospital, who for six or seven months was the Chief Surgeon in the American Hospital at Basingstoke, England, also subscribes to the Orr-Trueta method and states in his most recent writing that most English surgeons who are treating war casualties are very enthusiastic about this particular method. There is no question but

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what this method does fulfill all of the physical principles which are paramount in the treatment of infected soft tissue and broken bone. The method, in short, is careful débridement of the wound, adequate reduction of the fracture, packing of the wound wide open with vaselinized gauze, and immobilization of the extremity in a plaster-of-Paris casing. This plaster-of-Paris casing is left on until such a time as the cast becomes so soft due to the absorption of secretion from the wound that it is necessary to change the plaster. All of the plaster-of-Paris cast changings are done under general anesthetic and re-dressing of the wound is carried out under the most aseptic technique. This does give the tissues adequate rest. The tight plaster-of-Paris casing prevents local edema. The vaselinized gauze in the wound provides adequate drainage from the depths of the wound to the surface. The lack of daily dressings cuts down the possibility of cross-contamination in the wound. That cross-contamination occurs was very adequately borne out by the experience in World War I, because at that time all compound fractures were dressed daily. Bacteriological studies on these wounds showed that in the early stages only about 20 per cent of the wounds had streptococcus in them where after daily dressings for a period of two weeks about 85 per cent of the wounds had streptococcus contaminants. Without the necessity of daily dressings the patient's pain and disability are considerably reduced. Muscle spasm is not stimulated by the pain of dressing and there is accordingly less chance of displacement of the fragments. Academically, the Orr technique is a satisfactory method, and in the hands of those who are accustomed to using it, it is giving results which are as good as any other method can give at the present time.

There are some disadvantages to the Orr-Trueta method. The principal disadvantage is that the wound which is being treated as an infected rather than a contaminated wound is completely encased in a plaster-of-Paris cast, and is therefore not under direct vision. It takes a fine degree of surgical judgment to decide from the patient's complaints of pain, burning, and swelling of the extremity, and temperature elevation when plaster-of-Paris casing should be bivalved, the wound examined, or when the plaster-of-Paris cast should be windowed so that the wound can be examined. There is one other serious

drawback to the method, and that is that if a case of infected compound fracture is encased in a plaster-of-Paris cast, the diagnosis of a developing gas bacillus infection is very difficult to make. Trueta in his book points out that frequent check-up x-rays taken through the plaster-of-Paris cast will demonstrate the presence of gas bubbles in the tissue and that the diagnosis of gas gangrene may be made in this manner. The soundest clinical sign of an impending gas bacillus infection is an elevation of the pulse out of proportion to the elevation of temperature. With practice, the clinician is able to do a very satisfactory job of diagnosing an undrained pus pocket or impending gas bacillus infection even though the extremity is not under direct vision. In the hands of a man who is only occasionally treating this type of case, this method is rather dangerous because often a flare-up of the pyogenic infection or a developing gas bacillus infection may get sufficient start so that the only treatment that is left is amputation, and any method used in the treatment of compound fractures which leads to amputation is the method that is to be condemned.

The opposed method of treatment of compound fractures is that which requires a meticulous surgical débridement, then primary closure of the wound after reduction of the fracture, and maintenance of reduction either by a plaster-of-Paris cast or some type of traction apparatus. As has been mentioned before, Dr. J. Albert Key of St. Louis is a firm believer in this method. He feels that if a man is going to take care of compound fractures that his surgical judgment and skill should be developed to the point where he can do a satisfactory débridement, and he feels that if the débridement is done in the first six to eight hours and is done in a satisfactory manner that the wound is a sterile wound and under the circumstances will heal satisfactorily, by primary closure. Drs. Jensen, Johnsrud, and Nelson, Minneapolis, Minnesota, published a series of cases in 1939 in which they treated thirty-nine compound fractures and two compound dislocations. These wounds were treated by meticulous surgical débridement, local implantation of sulfanilamide, reduction of the fragments, maintenance of reduction in a plaster-of-Paris cast, and all of the wounds healed by primary intention. This series is pointed out at this time to show there is definite evidence that good débride-

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ment will permit primary closure of the wound without serious resulting consequences.

Between the method of Orr and Trueta and the method of primary closure, as suggested by Dr. Key, we have all the variants possible. Some men close some of their wounds by primary suture, some men treat some of the wounds by their own modification of Orr's method, some men do not close any wound tightly but close all wounds loosely with widely spaced interrupted sutures.

In general, most men agree the wound must either be sutured tight primarily, or it must be left wide open and that partial closure or closure around a drain carries with it more serious consequences than either complete closure or leaving the wound completely open. In short, there is no rule of thumb by which we may decide whether compound wounds are to be left open or whether they are to be closed. Dr. E. H. Caldwell in an article in the *Archives of Surgery* makes a very satisfactory statement. "The result of any procedure depends as much on the surgeon and his application as on the merits of the procedure."

A satisfactory working rule would be as follows: If a man is constantly and frequently treating compound fractures, then he may rely upon his own judgment as to whether the wound should be left open or whether it should be closed. It would seem that if he is constantly doing this type of work that his surgical ability and judgment would be developed to the point where he could, on the basis of experience, make a satisfactory decision as regards the treatment of the wound. On the contrary, if the compound fracture is being taken care of by someone who only occasionally does this type of work, then it would be safer to leave all of the wounds open, because the possibilities of serious consequences from a wound that is left wide open are much less than they are from a wound that has initial primary closure.

No wound, under any circumstances, should be closed without adequate débridement. Very often the physician giving First Aid will do a superficial cleansing of the wound and then close it preparatory to sending the case in to the hospital for further attention. Instead of helping the surgeon, who ultimately has the responsibility of care, he has only complicated the whole procedure. Nothing is gained by immediate closure without adequate débridement except that infection is assured.

Before leaving the subject "closure of the wound," it should be stated the primary object of treatment of compound fractures is not a plastic closure of the wound. It is rather a satisfactory functional recovery of the affected extremity. If the physician treating compound fractures will keep this point in his mind, the importance of closure of the wound will be relegated to its proper place in his consideration. It is, of course, very satisfactory to accomplish a primary closure of the wound because the patient is spared a disfiguring scar, surgery for a secondary closure when necessary, and the aesthetic disturbances which are incident to a chronically draining sinus. Any one or all of these things, however, are incidental compared to a septicemia, a fulminating local infection which would necessitate amputation, or a gas bacillus infection. Doctor Orr's work has proved very definitely that wounds which are left open do go on to satisfactory healing. The incidence of osteomyelitis at the point of fracture and the incidence of non-union is not increased by leaving the wound open. It is well to bear all of these facts in mind and make the decision on the basis of the case at hand and individual past experience.

Treatment of the Fracture

According to the original outline the next subject for discussion is, "The treatment of the fracture itself including the type of reduction and the immobilization which should be used." In its entirety this would include a careful discussion of the treatment of all types of fractures. Specifically, we wish to speak of the reduction and the immobilization of early compound fractures. There are primarily two schools of thought concerning this problem. Doctor Clay Murray and his group at Presbyterian in New York represent one school which believes in reduction under direct vision at the time of débridement and immobilization in the reduced position by means of internal fixation. The other school which is represented by various very excellent men believe there is no place for internal fixation in the treatment of early compound fractures. Here again, as in the question of "primary closure of the wound," the decision of which method is to be used must depend to a great, if not in its entire, extent upon the judgment and ability of the surgeon who is treating the case. In the hands of men who can do

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careful débridement, who are accustomed to doing bone surgery including open reduction and internal fixation of fractures, internal fixation may be used with relative impunity. The non-electrolytic metals, such as Vitallium, which are now available for internal fixation, act in only a very minimal capacity as a foreign body, and their advantages as regards more accurate reduction and more accurate immobilization far outweigh their disadvantages. Contrarily, in the hands of men who are not accustomed and not equipped to do extensive bone surgery, internal fixation of compound fractures is a very dangerous procedure. It increases the length of time the patient is under the anesthetic inordinately.

There is more shock to the patient, there is more trauma to the tissue, the local resistance is lowered, and as a result of this increased trauma the implied contamination of the wound has an opportunity to become infection. There is no dogmatic statement that can be made concerning whether internal fixation should be used or whether it should be completely disregarded. The problem at hand and the person who is taking care of the case must definitely enter into the decision as to whether internal fixation should be used.

What type of immobilization should the fracture have regardless of whether internal fixation has been used or not? There is a definite unanimity of opinion concerning the fact that a plaster-of-Paris cast should be used wherever possible and that traction, either skin or skeletal, should be avoided whenever their avoidance does not impair the recovery of the patient. Those men who are using skeletal traction of the early immobilization of their fractures are also recommending that patients that are put up in traction should have anterior and posterior gutter plaster-of-Paris casts applied so there is the additional immobilization of the cast during the traction period.

Plaster-of-Paris casts have many advantages over other types of immobilization. They supply equally distributed pressure around the circumference of the affected extremity. This pressure does several things. It tends to reduce the extent of the local edema and swelling. It prevents asymmetrical swelling, and subsequent bowing at the fracture site. It actually rigidly fixes, if properly and extensively enough applied, the joint above and below the fracture, and by virtue

of its equally applied compressive effect it maintains a more adequate circulation in the affected extremity. There is no other type of immobilization which will do all of these things, and because of this factor all compound fractures whether treated with or without internal fixation should be immobilized in circular plaster-of-Paris casts if at all possible. The major exception to this rule are fractures of the upper half of the shaft of the femur which are complicated by severe and extensive soft tissue damage. It is often impossible either with or without internal fixation to maintain these fractures in proper alignment and the element of traction is necessary to prevent overriding. In such cases skeletal traction either in a Thomas splint, Hodgen splint, or on a Bohler frame is probably the most satisfactory method of maintaining reduction. When it is possible, anterior and posterior gutter splints of plaster-of-Paris should be applied; and as soon as there is sufficient bony healing to permit maintenance of position in a plaster-of-Paris cast, a double hip spica should be applied with the plaster extending down as far as the knee on the unaffected side.

Metallic Pins

Recently, there has been extensive work done on the incorporation of metallic pins which transfix the fragments and are secondarily incorporated in the plaster. The method has been particularly adapted to use in fractures of both bones of the leg. There is considerable literature on this type of immobilization, and we can say accurately that the consensus of opinion is that if these transfixion pins are put in the fragments far enough away from the compounding area so they do not transfix any of the pockets of soft tissue damage, you can get by without spreading the infection by the insertion of the pin. It is an excellent method of maintaining reduction, and by the use of any one of the several machines which are used to hold these pins in place it makes an ideal method of maintaining reduction and holding the leg immobile while the plaster-of-Paris cast is being removed and while the dressing is being done and a new plaster-of-Paris cast is being applied. This particular method happens to be the method used by Dr. Philip Wilson and his successors at the American Hospital at Basingstoke, England. They are very well satisfied with their results and they go

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even farther and use the mechanical machine to accomplish the reduction under fluoroscopic control. Roger Anderson states if transfixion pins are used, four should be inserted—two above and two below the fracture site. It is his contention that the additional trauma of the insertion of four rather than two pins is overcome by the increased immobility which the four pins produce. There are some men who have carried this transfixion pin method a step further and are using transfixion pins to immobilize fractures of the shaft of the femur. This is a much more difficult problem from a surgical standpoint because the positioning of the pins in the femur in order to maintain both the proximal and distal fragments immobile is a much more difficult job. Those men who are using this method are reporting very satisfactory results.

Sulfa Drugs

In starting to discuss the use of chemical anti-septic and bactericides as an adjunct to the treatment of compound fractures, one immediately thinks of the sulfonamide drugs. This is easily understood because in the last few years the sulfonamide derivatives have reached a popularity which very few other chemical compounds have ever attained. This popularity is easily explained because as we understand the drugs at the present time they have a nearly universal application in the treatment of infection. Originally, their use was recommended only in the treatment of pneumonia. Gradually this was enlarged so it included all types of pneumonia, gonorrhea, any systemic sepsis, and more recently has been used for local implantation into infected wounds, osteomyelitic cavities, and very recently used as a topical application for many types of local skin infection, and for the treatment of the acutely burned. Just how to evaluate a drug that is as widely used as the sulfonamide group is a very difficult problem. It has been over-used in many cases. It has been used where the indications were not proper in a very large number of cases. Like all good surgical and medical principles when it is used skillfully in the conditions in which it is indicated, it will do nearly as much for the patient as the detail men would have us believe.

In 1939 in the Minneapolis General Hospital three men, Drs. Jensen, Johnsrud, and Nelson, published a preliminary report of the use of local

implantation of sulfanilamide in the treatment of compound fractures. At this time these authors reviewed the figures published by authorities on the treatment of compound fractures as regards the incidence of infection in the compound fractures. Bohler at Vienna reported 8.6 per cent severe wound infections in 127 cases of compound fractures. Bohler quoted 14 per cent for Koch in 213 cases, 8.6 per cent for Ehalt in 127 cases, and 17.3 per cent for Schmidt in 116 cases. Ritter in the United States reported 9 per cent infections, Foster 15.7 per cent, and Poyner with industrial cases treated under ideal conditions reported only 6.3 per cent in 269 cases. Jensen, et al., further pointed out that the cases with which they were dealing were entirely different than those cases with which Poyner was dealing, in that Poyner was treating purely industrial accidents which received expert first aid care at the time of injury and were immediately brought to the hospital without any meddlesome pre-hospitalization care. In reviewing their own figures in their own hospital on cases that were municipal charges sustaining injury primarily from automobile accidents, they found that in 1932 they had 25.8 per cent infection in 32 compound fractures, and in 1937 they had 27.5 per cent infection in forty compound fractures. They included all cases in which there was a drainage of pus, and did not limit the classification of infection to those cases which developed a frank osteomyelitis. Jensen, et al., further used several methods of treatment and felt that their figures were not improved by any particular type of treatment. Dakinization of the wound resulted, in their hands, in 100 per cent infection. Leaving the wound open after débridement and packing with vaseline gauze and application of a circular cast was again, in their hands, less effective than primary suturing after débridement. Immobilization in plaster with traction, when needed, gave better results than traction alone, and was the method most used. In summary, they report the treatment of thirty-nine compound fractures and two compound dislocations using the following method: Complete meticulous surgical débridement of the wound, manipulation and reduction of the fracture under direct vision at the time of the débridement, immobilization of the reduced fractures in a plaster-of-Paris cast, or in a combination of plaster-of-Paris cast and skeletal traction, if the traction is necessary to main-

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tain reduction, local implantation of from five to fifteen grams of sulfanilamide, and primary suture. In those cases in which sulfanilamide was implanted locally in the wound, all of the cases healed by primary intention with no case of secondary infection. A control series, 94 open fractures, treated by the same procedure except the implantation of sulfanilamide, showed 27 per cent infection, seven cases of gas gangrene, and five amputations to control infection.

This work is very sound, the article reporting is well-documented, and their principles of treatment are good. There is no question but that the local implantation of, in this case, sulfanilamide has in this series of cases definitely contributed toward the prevention of infection in compound fractures, and because of this and similar corroborating works the sulfonamids, either sulfanilamide or sulfathiazole, should be implanted in all freshly débrided compound fractures.

Local implantation of sulfanilamide, or any of the sulfonamid derivatives, will not correct the evil of poor surgical technique, poor surgical judgment, or the failure of the attending man to give the case adequate care. This point must be strongly emphasized. The sulfonamid group of drugs are an adjunct and an important one in the treatment of compound fractures, but they are not a panacea. Because they have been used does not mean that the rest of the procedure necessary to treat a compound fracture can be slighted. There is a tendency for all doctors in their enthusiasm for a new and apparently satisfactory method of therapy to depend entirely upon the new method and to forget that there are incumbent in the older methods certain fundamental principles which must be carried over and used in conjunction with any new therapeutic method. There will be a tendency with the increasing use of the sulfonamids for men who are totally unprepared, surgically, to attempt the treatment of compound fractures. Undoubtedly they will get by in many cases because without the use of sulfanilamide 70 to 90 per cent of cases of compound fracture heal without infection. The cases that we are interested in influencing, however, are not the cases which will heal without the use of sulfanilamide but rather the small percentage of cases which, with the combined use of good surgical technique and judgment and local implantation of sulfanilamide, will heal, and heretofore had not healed. In the treatment of

compound fractures as in the treatment of all other conditions our object is not to let nature do the work and take the credit for it, but rather is it to assist nature so that we will influence favorably those cases which by past experience nature would not take care of alone.

Other Drugs

World War I gave us the Carrell-Dakin method of treating compound wounds. This method even at the time it was being used was not as widely accepted as it was originally hoped for. At present with the exception of certain isolated institutions the Carrell-Dakin method of irrigation of the wound in compound fractures is not used. Dr. Baer's method of the implantation of maggots in compound wounds in order that the maggots by means of autodigestion would clear up the sloughing material and reduce the degree and incidence of infection is at present in essentially complete disuse. Intravenous mercurochrome was at one time advised in the treatment of systemic infections secondary to compound fractures. At the present time no one uses intravenous mercurochrome. The drug used in this manner has more disadvantages than advantages. The local use of bacteriophage in compound wounds, which was and still is highly recommended by Dr. Fred Albee, has only equivocal advantages. In Dr. Albee's hands and according to his report it is a very advantageous method. There are no reports in the literature covering the last three years concerning the use of this method of treatment of compound fractures.

As regards chemical bactericides and antiseptics in the treatment of compound fractures, we have at the present time only one important group and that is the sulfonamid drugs. Either sulfanilamide or sulfathiazole seems to be satisfactory, and the amounts used vary between five and fifteen grams, depending upon the size of the wound. The local use of the drug should be amplified by oral administration of the drug and maintenance of the patient's blood level at the accustomed height until such time as the possibility of infection in the wound has disappeared. The usual check should be made on blood level, white blood count, and on urinalysis daily in order to be sure the patient is not getting a toxic amount of the drug or is not developing any of the untoward side chain effects that the drug sometimes produces.

Statistics

Before summarizing the information presented concerning the treatment of compound fractures, it will be well to review some figures quoted by Dr. H. Winett Orr in the *Illinois Medical Journal*, July, 1939. He states, "We do not take the compound fracture situation as seriously as we should. For one reason the actual results of our care of patients in these and similar infections is seldom known.

"So many of these patients drift from one surgeon to another, or from one hospital to somewhere else that our statistics seldom give us the correct impression of the real situation."

Orr quotes further from the figures from the military draft in 1917. There were 2,000,000 men examined in the draft, one-fourth of whom were physically unfit for military service. Disability in the lower extremity led to rejection of 40,000 men. Of those rejected 5,500 had malunion following fractures, 7,700 more were rejected because of shortness of the leg, 8,600 were rejected because of loss of the lower extremity. There were, then, 21,800 out of 40,000 rejected because of direct disability due to compound fractures of the lower extremity. Orr continues to quote that the British had a mortality of 60 per cent during 1914-1915 in the treatment of compound fractures of the femur. This was reduced quite considerably after Sir Robert Jones and his associates introduced the use of the Thomas splint and its application to the injured soldier before he was moved. He continues to report that Sir Anthony Bowlby in 1920 reported that of 3,000 patients with compound fractures 17.5 per cent (550) died at the front. One-fourth of this group were treated by amputation. Later, in the base hospital, 300 (10 percent) more died of secondary complications and after amputation, and 3 per cent more died at the base hospital in England so that the total of this 3,000 series was about 30 per cent. Our own Surgeon General's report in 1926 was of interest in that it showed 5,138 (23 per cent) of all the world war fractures were fractures of the femur. Eight years after the armistice 2,469 (48 per cent) were still more than 50 per cent disabled. 1,122 had been amputated, and shortening of the limb was present in more than 2,000 (about 42 per cent of the cases). These figures are quoted in order to demonstrate the severe mortality and disability secondary to treatment of

compound fractures. It is appreciated that any figure quoted from a wartime experience is not comparable to civilian practice experience because the time, equipment, and conditions with which the surgeons work are not comparable in the two experiences. The wartime figures, however, must be used because they are probably the largest single series of cases, and inasmuch as at least the base hospital work was done by competent men, these figures at least indicate generally the results of care.

Before leaving statistics it will be well to review the figures quoted by Dr. Jose Trueta in his book, "Treatment of War Wounds and Fractures." His statistics are based on a total figure of 1,073 cases of open fracture of the limb treated by immediate surgical debridement, reduction of the fracture under direct visualization at the time of debridement, packing of the wound with vaseline gauze, and immobilization of the extremity in a plaster-of-Paris cast with the plaster-of-Paris cast left on until such a time as either the odor or the drainage into the plaster was so severe that change was necessary. Of his total of 1,073 cases he had, in his opinion, 976 good results, 91 (11.8 per cent) bad results, and six deaths. Of the six fatal cases, two were deaths following amputation for gangrene which developed after the conservative treatment had been instituted, one was due to shock when the patient was gravely injured by an aerial bomb, one due to pyemia, one to pulmonary embolus, and one to broncho-pneumonia. This author states that about 20,000 cases received this type of treatment during the Civil War in Spain, but there are not detailed statistics available of this group and he has reported only those cases which were under his direct care and on whom he does have detailed statistics. Here again we are dealing with wartime experience and the statistics must be taken with a grain of salt, because although they were probably very satisfactory under the circumstances that existed, they are probably not comparable to the circumstances or the treatment that would be available in private practice. However, six deaths in a series of 1,073 cases of compound fracture is a very satisfactory figure, and only ninety-one so-called bad results is also a most satisfactory figure. The unfortunate thing about this particular series is that the author does not clearly state how he judged his cases as

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to whether their end result was satisfactory or unsatisfactory.

Summary

It was the express purpose of this paper to make a review of the current literature on the early treatment of compound fractures and to present a review of the varieties of treatment which are at present being recommended in the care of compound fractures. Rather than simply summarizing the material presented, an attempt will be made to present an arbitrary method for the handling of all compound fractures based on the material presented. This method would be particularly applicable to the handling of compound fractures in this or similar hospitals where these cases are receiving their care not under the direction of one man and his staff but rather under a diversified group of attending surgeons.

1. All compound fractures should be treated as emergencies at the scene of the accident. They should be splinted, preferably in a Thomas leg splint or a Jones arm splint depending on the extremity involved. No exposed ends of bone should be reduced back into the wound until such a time as there has been careful surgical cleansing of both the wound and the exposed bone. Aside from splinting the only treatment that should be administered at the scene of accident is covering of the wound with clean, sterile if possible, dressing, and application of a tourniquet if it is indicated for the control of hemorrhage. In this respect every effort should be made by the physicians in their respective communities to not only prepare themselves to give this kind of emergency treatment if they are called upon for it, but they should also discharge their responsibility to the community by making every effort possible to teach the lay people, gas station attendants, ambulance drivers, policemen, and state policemen the essentials of this emergency treatment.

2. The patient should be treated as an emergency as soon as he is admitted to the hospital for care. All the departments in the hospital including the x-ray department, the resident staff, surgical department, and the attending staff should be willing to give this type of patient preference over any other type of patient which may be utilizing the departments in question at any time.

3. The patient with a compound fracture should have an adequate neurological and medical

examination before any therapy is carried out in order to determine two things: (1) Whether or not the patient has a well-developed shock, or whether they are bordering on shock. If the shock has developed, this can be ascertained by clinical examination including direct observation for the cold, sweating extremities, pallor, and breathlessness, and further by blood pressure, and pulse readings. Those cases bordering on shock may be picked up most accurately by hematocrit and plasma protein determination. (2) An adequate neurological examination in order to determine whether or not the patient has a possible brain injury in order that this may be taken into consideration in outlining the further care.

4. If shock or borderline shock is present, shock therapy should be instituted. This is to include bed rest with immobilization of the fractured extremity in a splint, heat by means of warm blankets or hot water bottles, morphia to control the pain, intravenous fluids, small blood transfusion or human plasma preferably, glucose and saline 5 per cent if the other is not available, and adrenal cortex extract to further fortify the shock therapy. This is to be an active therapy, the purpose of which is to get the patient out of the shock condition as rapidly as possible in order that the compound fracture may be cared for within the six to eight hours deadline between contamination and infection of the compound wound. All other treatment in the case of the shocked patient should be held in abeyance until such a time as the condition of the shock has been adequately cared for.

5. Adequate pre-operative x-rays. This is most important particularly in civilian practice and is something, when general hospital facilities are available, that should never be overlooked.

6. The administration of 1500 units of antitetanic serum in all cases of compound fractures and the use of a prophylactic dose of the mixed gas bacillus infection serum in all cases where there is any definite or questionable soil contamination of the wound.

7. Meticulous surgical debridement of the wound under general anesthetic with careful attention to the removal of devitalized, injured, and soiled soft tissue in the affected extremity. This will require enlarging the compound wound so that the major portion of the extremity is under direct visualization and so that all pockets of devitalized tissue are opened up and thoroughly cleansed. The question of whether the wound

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should be closed by primary suture or whether it should be treated as an open wound should be carefully considered by the attending man, and in those cases in which there is any question the wound should be left open and packed with vaseline gauze. No wound should be partially closed or closed around a drain; they should either be completely closed or they should be left wide open. It is impossible to be arbitrary about this particular part of the treatment, and it will be necessary to leave this to the judgment of the men attending the particular case in question.

8. All early compound fractures should be packed with between 5 and 15 grams of either sulfanilamide or sulfathiazole; the amount should depend on the size of the wound and the age of the patient. Either sulfanilamide or sulfathiazole by mouth should be administered in the accustomed doses to the patient postoperatively, until such a time as there is no question of any developing infection.

9. Reduction of the fracture should be obtained under direct vision. Internal fixation may be used if in the opinion of the attending man it will insure better immobilization of the fracture and eliminate the necessity of the application of traction in order to maintain satisfactory reduction of the fracture.

10. All early compound fractures after debridement and reduction should be immobilized when possible in a circular plaster-of-Paris cast, and the use of skeletal or skin traction should be avoided unless it is absolutely impossible to maintain satisfactory reduction without traction. Transfixion pins may be used as indicated.

11. Those cases that are being left open and packed with vaseline gauze and that are being reduced and immobilized in plaster-of-Paris casts, should not have a window cut in the plaster over the compound area because this will nearly routinely produce bowing at the fracture site with the subsequent loss of re-reduction.

12. Adequate postoperative x-rays must be taken in order to be sure that satisfactory position is being maintained. The first postoperative x-ray should be taken as soon as the patient's condition will permit in order to be sure that during the application of the plaster-of-Paris cast no position was lost. Another x-ray should follow in a period of five to seven days to be sure

there has been no change following the gradual reduction of the swelling of the extremity. If the position is still good at this time, then further x-rays may be done at the will of the attending physician. Adequate x-ray examination during the postoperative period will also help to pick up a developing gas bacillus infection in those cases encased in a plaster-of-Paris cast because the x-ray will show any gas that may develop in the tissues.

13. These patients postoperatively must be watched very carefully from a clinical standpoint. The circulation of the toes, adequate elevation of the affected extremity, the patient's temperature and pulse chart with particular reference to whether or not the pulse is running in accordance with the temperature are important. As has been mentioned, one of the most satisfactory clinical criteria for diagnosing early gas bacillus infection is a rapid pulse out of proportion to the patient's temperature.

14. Inasmuch as in civilian practice most compound fractures are either street or industrial accidents, and therefore potential medico-legal cases, adequate pre- and postoperative notations by the surgeon should be made concerning the patient's condition, the location of the fracture, the extent of the compound wound, and also and very particularly the presence or absence of motor or sensory lesion not only in the affected extremity but in other extremities.

Bibliography

- Aspinall, A.: Wiring of compound fractures; case reports. Australia and New Zealand Jour. Surg., 6:394, (April) 1937.
Beekman, F.: Compound fractures in childhood. Am. Jour. Surg., 39:312-318, (Feb.) 1938.
Berry, C. T.: Open and closed treatment of compound fractures. Mississippi Doctor, 18:669-672, (May) 1941.
Bost, F. C.: Compound fractures; importance of emergency treatment. Calif. and Wes. Med., 49:185-187, (Sept.) 1938.
Boyd, W. A.: Compound fractures; management and treatment. Indust. Med., 9:147-149, (March) 1940.
Caldwell, E. H.: Compound fractures. Am. Jour. Surg., 43: 554-559, (Feb.) 1939.
Caldwell, G. A.: Compound fractures; management. South. Med. Jour., 31:746-750, (July) 1938.
Caldwell, G. A.: New developments in treatment of compound fractures. Ann. Surg., 113:705-711, (May) 1941.
Caldwell, G. A.: Treatment (with sulfanilamide, zinc peroxide paste and roentgen rays) of gas gangrene experimentally produced (in compound fractures). Jour. Bone and Joint Surg., 23:81-85, (Jan.) 1941.
Campbell, W. C., and Smith, H.: Sulfanilamide and internal fixation of compound fractures. Jour. Bone and Joint Surg., 22:959-972, (Oct.) 1940.
Campbell, W. C., and Smith, H.: Sulfa-drugs (sulfanilamide and its derivatives) and internal fixation in compound fractures. South. Surgeon, 10:409-426, (June) 1941.
Cannaday, J. E.: Primary closure of traumatic wounds, with especial reference to conversion of compound into simple fractures. Am. Jour. Surg., 47:375-390, (Feb.) 1940.
Carlucci, G. A.: Compound fracture of the lower extremities. New York State Jour. Med., 37:2006, (Dec. 1) 1937.
Charache, H.: Some aids in treatment of compound fractures. Am. Jour. Surg., 36:551, (May) 1937.
Colonna, P. C.: Compound fractures. New Orleans Med. and Surg. Jour., 93:570-574, (May) 1941.
Creyssell, J.: Primary therapy of compound fractures at front. Presse med., 47:1612-1613 (Dec. 13-16) 1939.
Cubbins, W. R., Callahan, J. J., and Scuderi, C. S.: Compound fractures. Illinois Med. Jour., 78:521-523, (Dec.) 1940.

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- Culley, J. C.: Therapy of compound fractures in small hospital. *Mississippi Doctor*, 18:391-393, (Dec.) 1940.
- Darrach, W.: Compound fractures. *Arch. Surg.*, 40:821-824, (May) 1940.
- Darrach, W.: Treatment of compound fractures. *Surg., Gynec. and Obst.*, 46:815, (April) 1938.
- Deacon, A. E.: Compound fractures, gas gangrene and tetanus. *Manitoba Med. Assn. Rev.*, 18:213-217, (Nov.) 1938.
- Eloesser, L.: Treatment of compound fractures in war; practical experience in Spanish Civil War. *Jour. A.M.A.*, 115:1848-1852, (Nov. 30) 1940.
- Felicetti, J. C.: Compound fractures. *Med. Times*, New York, 66:472-475, (Oct.) 1938.
- Funsten, R. V., and Frankel, C. J.: Compound fractures of extremities; results of treatment. *U. S. Nav. Med. Bull.*, 38:494-499, (Oct.) 1940.
- Hermann, O. J.: Compound fracture therapy at Boston City Hospital. *Arch. Surg.*, 40:853-866, (May) 1940.
- Hermann, O. J.: Treatment of Compound Fractures. *New Eng. Jour. Med.*, 217:909 (Dec. 2) 1937.
- Heyl, J. H.: Compound fractures of long bones. *Ann. Surg.*, 111:470-490, (March) 1940.
- Jackson, R.: Comparative study of treatment of compound fractures. *South. Med. Jour.*, 34:319-323, (March) 1941.
- Jensen, N. K., Johnsrud, L. W., and Nelson, M. C.: Local implantation of sulfanilamide in compound fractures; preliminary report. *Surgery*, 6:1-12 (July) 1939.
- Johnson, R. W.: Chemotherapy (sulfanilamide) in prevention of infection in compound fractures. *Am. Jour. Surg.*, 49:195-200, (July) 1940.
- Kennedy, R. H.: Present-day treatment of compound fractures. *Ann. Surg.*, 113:942-954, (June) 1941.
- Key, J. A., and Burford, T. H.: Local implantation of sulfanilamide in compound fractures; effect on healing. *South. Med. Jour.*, 33:449-455, (May) 1940.
- Key, J. A., and Lembeck, J. A.: Local use of sulfanilamide in compound fractures. *Indust. Med.*, 9:493-497, (Oct.) 1940.
- Koch, S. L.: Immediate treatment of compound injuries. *Surg., Gynec., and Obst.*, 68:961, (May) 1939.
- McBride, E. D.: Compound fractures; analysis of 100 cases. *South. Med. Jour.*, 32:243-247, (March) 1939.
- Maddock, S., and Jensen, D.: Treatment of septic compound fractures of the tibia with maggots. *New Eng. Jour. Med.*, 217:123, (July 22) 1937.
- Mason, M. L.: Immediate treatment of compound injuries. *Ill. Med. Jour.*, 72:249, (Sept.) 1937.
- Moore, A. T., and Green, J. T.: Compound fractures and their treatment. *South. Med. Jour.*, 32:891-906, (Sept.) 1939.
- Orr, H. W.: Importance of primary care in compound fractures. *South. Med. Jour.*, 34:315-319, (March) 1941.
- Orr, H. W.: Compound fractures, with special reference to lower extremity. *Am. Jour. Surg.*, 46:733-737, (Dec.) 1939.
- Orr, H. W.: Treatment of compound fractures, with special reference to military surgical procedures. *Arch. Surg.*, 40:825-837 (May) 1940.
- Orr, H. W.: Wound infection and compound fractures. *Ill. Med. Jour.*, 76:71, (July) 1939.
- Patterson, D. C.: Compound fractures. *Connecticut Med. Jour.*, 4:666-669, (Nov.) 1940.
- Pfeiffer, D. B., and Smyth, C. M., Jr.: Treatment of compound injuries by closed plaster encasement method. *Ann. Surg.*, 113:1050-1054, (June) 1941.
- Poston, H.: Compound fractures of shafts of long bones. *Lancet*, 1:1201-1203, (May 27) 1939.
- Reynolds, J. T., Zeiss, C. R., and Cubbins, W. R.: Compound fractures. *Arch. Surg.*, 40:844-852, (May) 1940.
- Rhodes, R. L.: Compound fractures. *Jour. Med. Assn. Georgia*, 27:8-9, (Jan.) 1938.
- Ross, T. E.: Compound fractures. *Mississippi Doctor*, 16:28-32, (Oct.) 1938.
- Scuderi, C. S.: Compound fractures. *Illinois Med. Jour.*, 76:160-162, (Aug.) 1939.
- Sherman, W. O.: Compound fractures. *Arch. Surg.*, 40:838-843, (May) 1940.
- Simon, H. T., et al.: Bone regeneration following maggot therapy in compound fractures. *Jour. Bone and Joint Surg.*, 19:985, (Oct.) 1937.
- Smith, H.: Emergency treatment of compound fractures. *Memphis Med. Jour.*, 15:106-107, (July) 1940.
- Stimson, B. B.: Literature on fractures; collective review of years 1935, 1936, and 1937. *Internat. Abstr. Surg.*, 70:58-72, 1940, in *Surg., Gynec. and Obst.*, (Jan.) 1940.
- Stuck, W. G., Maxwell, E. A., and Monsalvo, R. N. O.: Crystalline sulfanilamide in compound fractures. *Texas State Jour. Med.*, 36:225-228, (July) 1940.
- Thomson, J. E. M.: Ten commandments for treatment of compound fractures. *Jour. A.M.A.*, 115:1855-1860, (Nov. 30) 1940.
- Venable, C. S., and Stuck, W. G.: Use of vitallium appliances in compound fractures. *Am. Jour. Surg.*, 51:757-766, (March) 1941.
- Venable, C. S., and Stuck, W. G.: Prevention of deformities in compound fracture treatment. *South. Surgeon*, 10:234-246 (April) 1941.
- Walkling, A. A.: Contaminated wounds and compound fractures. *Surg. Clin. North America*, 17:1619-1624, (Dec.) 1937.
- Wilson, M. J., and Cantwell, A. R.: Immediate closure of compound fractures. *New York Med. Coll. and Flower Hosp. Bull.*, 3:219-222, (Dec.) 1940.
- Wilson, P. D.: Treatment of compound fractures resulting from enemy action. *Ann. Surg.*, 113:915-924 (June) 1941.

Prolonged Labor*

Analysis of 206 Maternal Mortalities Associated with Prolonged Labor

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The occurrence of prolonged labor connotes some abnormal condition in either powers, passages or passenger. The incidence of, and etiological factors in prolonged labor in three hospitals have been analyzed. The incidence varies. The factors have been analyzed. Treatment has been reviewed. The circumstances surrounding 206 maternal deaths associated with prolonged labor occurring in Philadelphia in the past eleven years have been analyzed. Observations have been on the causes of death and method of handling these 206 cases.

THE act of childbirth is concerned with the relationship of three factors, the passages, the passenger, and the powers of expulsion. In a normal labor the expulsive forces hold a balance of power over the resistance of the birth canal to the descent and delivery of the fetus. Under ordinary circumstances the mechanism of labor in the primigravida is completed in approximately eighteen hours, in multipara in from eight to twelve hours. Variations of considerable degree either way may be noted, generally with favorable results. Where the labor tends to be longer than usual some abnormal condition of one or more of the three factors concerned will be found present. The abnormality may be slight or labor may be prolonged to a point where mother or fetus, or both, face danger. In some instances the labor may be obstructed without the attendant realizing the fact or its basic cause.

For the latter reason obligatory consultations in hospital practice for labors protracted beyond a fixed time have been suggested by various maternal welfare groups. In general a limit of twenty-four hours is permitted before such required consultation, but many individual hospitals have set a shorter period of eighteen hours.

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TABLE I. PERCENTAGE CAUSES OF PROLONGED LABOR AMONG 6000 DELIVERIES IN THREE HOSPITALS

Contracted pelvis.....	12.5 per cent
Errors in rotation and flexion.....	39 per cent
Large baby (breech, twins).....	13 per cent
Inertia uteri (soft parts).....	26.5 per cent
Toxemia	3 per cent
Other obstetric and medical complications..	6 per cent

It is apparent that a labor longer than twenty-four hours is widely regarded as evidence that some abnormality of the mechanism of labor may be present. It is essential to determine that a normal or physiological prolongation, as in occiput posterior in a primigravida may not be confused with a pathological prolongation, as in a contracted pelvis.

To determine the incidence of labors prolonged over twenty-four hours the histories for 6,000 labors consecutively prior to January 1, 1942, in hospitals with which I am connected were examined. This showed an average of 4.7 per cent of the labors lasted over twenty-four hours; approximately one in every twenty. It was difficult to regard racial factors as playing a part and it was not felt that sedation, used in about one-third or less of the private patients was of marked influence. Huber recorded the incidence of prolonged labor, twenty-five hours or over, at the Chicago Lying-In Hospital as 6.3 per cent, Cosgrove noted an incidence of 5.9 per cent in the Margaret Hague Hospital. An analysis of prolonged labors in this series of 6,000 consecutive deliveries showed the basic cause for the delay as follows:

In thirty cases, just under 10 per cent of the series, more than one basic cause was present. The histories were regarded thoughtfully from the obstetric standpoint and it was felt the basic cause had been put down without bias. A larger sampling than 6,000 labors might have changed the proportions of the items. (Table I.)

In contrast to this group, in which the maternal, fetal, and neonatal mortality were minimal, a series of 206 cases in which the labor lasted over twenty-four hours was obtained from the files of the Committee on Maternal Welfare of the Philadelphia County Medical Society for the years 1931 to 1941, inclusive. Each case represented a maternal death.

During this period of eleven years, in Philadelphia, 20 per cent of all deaths in women over

TABLE II. PERCENTAGES OF CAUSES OF PROLONGED LABOR IN 206 PATIENTS WHO DIED

Contracted pelvis.....	21.8 per cent
Errors in rotation and flexion.....	21.3 per cent
Large baby (breech, twins, et cetera).....	18.5 per cent
Inertia uteri (soft parts).....	21.3 per cent
Toxemia	10.7 per cent
Other obstetrical and medical conditions..	6.3 per cent

TABLE III. CAUSES OF PROLONGED LABOR IN SIXTY MULTIPARAS

Contracted pelvis.....	7
Errors in rotation and flexion.....	11
Large baby (breech, twins, et cetera).....	17
Inertia uteri (soft parts).....	12
Toxemia	7
Other causes.....	6

Average length of labor in multiparas was forty-nine hours.

twenty-eight weeks pregnant occurred in cases where the labor was prolonged over twenty-four hours. If a condition which occurs once in twenty labors is present so frequently in truly obstetric deaths, one in five, its basic causes, and their prompt recognition and proper treatment is worthy of our serious consideration. The incidence of basic causes in the 206 fatal cases is shown. Eight per cent showed more than one basic cause. Forty-eight of the women were colored; this race constituted one-third of the contracted pelvis group. (Tables II and III.)

Parity was expressed as follows: first pregnancy, 146; second pregnancy, 22; third to fifth, 20; sixth to eighth, 9; over eighth, 9.

Race was divided as follows: White women, 158; colored women, 48.

The age groups were divided as follows: under twenty years, 23; twenty to twenty-five years, 36; twenty-five to thirty years, 66; thirty to thirty-five years, 44; thirty-five to forty years, 27; over forty, 10.

Cause of Death

While some of the differences between these sets of basic causes are striking, one hesitates to draw inferences because of the chances of error involved in such small samples. (Table IV.)

An analysis of the causes of death by a critical survey of the histories leads to this information. (Table V.)

Incorrect certification of death was frequently noted in the early years of the study from which this material was drawn. The diagnosis concurred by the Committee under such circumstances is used here. Every other woman in the

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TABLE IV. CONTRAST OF BASIC CAUSES OF PROLONGED LABOR.

	Percentage Hospital Series	Percentage Fatal Cases
Contracted pelvis	12.5	21.8
Errors in flexion and rotation	39	21.3
Large baby	13	18.5
Inertia uteri	26.5	21.3
Toxemia	3	10.7
Other obstetrical and medical complications	6	6.3

TABLE V. PERCENTAGES OF CAUSES OF DEATH IN 206 FATAL CASES OF PROLONGED LABOR

Sepsis	50%
Shock	25%
Hemorrhage	13%
Toxemia	5%
Other obstetrical and medical causes.....	7%

TABLE VI. DURATION OF LABOR IN 206 FATAL CASES, ASSOCIATED WITH PROLONGED LABOR

Over 20 hours, less than 30.....	47
Over 30 hours, less than 36.....	27
Over 36 hours, less than 48.....	43
Over 48 hours, less than 60.....	42
Over 60 hours, less than 96.....	26
Over 96 hours.....	19
Average	48 hours
Longest	8 days

series died of sepsis. Every fourth woman died of shock. Approximately every eighth woman died of hemorrhage. The average duration of these 206 labors was just under forty-eight hours. (Table VI.)

Contracted Pelvis

Contracted pelvis was the basic cause in prolonging the labor in forty-five cases (21.8 per cent) in this series; in seven of the sixty multiparas. The average duration of the labors in this group was forty-seven hours. One-third of these women were colored. (Table VII.)

The mechanism of normal labor is disturbed when shortened pelvic diameters impede the engagement or advance of the presenting part.

The question of labor in contracted pelvis hinges upon whether disproportion exists at term, whether it is absolute, requiring abdominal delivery; moderate with some risk to the fetus

TABLE VII. METHODS OF DELIVERY AND CAUSES OF DEATH IN PROLONGED LABOR DUE TO CONTRACTED PELVIS
Forty-five Cases

	No.	Sepsis	Shock	Hemorrhage	Other
Classical section	22	19	3		
Cervical section	12	7	3	1	1
Porro section	1		1		
Forceps	4	3		1	
Craniotomy	2	1	1		
Version	1	1			
Spontaneous delivery	1	1			
Undelivered	2		1		1
Multiple operations	14	7	6	1	

through pressure effects or operative trauma in vaginal delivery; or minimal when but little danger may be expected for either mother or child.

A careful study of every woman during the prenatal period should enable one to determine if vaginal delivery is likely or doubtful. Roentgen studies should be made where such clinical examinations as Leopold's fourth maneuver, Perret's test, or Hillis' impression method suggest that engagement of the head in the brim apparently is not possible. By such tests and competent consultations one may form a fairly definite idea as to the probability of vaginal delivery and be forewarned of altered mechanisms which may develop or the complications which may arise.

The question of test of labor arises frequently in cases of so-called borderline contraction of the pelvis or borderline cephalopelvic disproportion. It is hard to define the term "test of labor." A working rule might be that with a suspicious relationship of the head and pelvis, eight hours active labor pains less than five minutes apart and of good quality should be allowed. The hoped for effect of the uterine contractions should not be obscured by the use of analgesic agents. If at the end of this period engagement and some descent, determined by rectal examination, have not occurred, abdominal delivery is indicated.

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Borderline cases of contracted pelvis will often permit successful forceps delivery of a living child, if effective uterine contractions have moulded the head to accommodate the shortened pelvic diameters. It may be elected in some situations to allow a prolongation of labor if progress, though slow, is evident. The adaptation of the head to the particular type of pelvis should be borne in mind, for the delivery of the head with occiput posterior may at times be more favorable in oval type of pelvis. The danger of trauma of forceps delivery in opening up avenues of entrance for potentially present infection in prolonged labor should be borne in mind.

The obstetric history of the multipara should disclose previous difficult vaginal delivery, often with stillbirth, sufficiently early to avoid the complication and danger of a prolonged labor from contracted pelvis in a succeeding pregnancy. Several cases in the contracted pelvis group gave not only this history but, in addition, showed those physical characteristics described by Horner which have been labelled the dystrophia dystocia group. These short, thick-set women with masculine habitus and distribution of hair, and who frequently show other evidence of glandular dysfunction, especially the hypothyroid type, should always be suspected of developing abnormal labors in their funnel pelves.

If the condition is first met in labor, particularly, if the membranes are ruptured, no vaginal examinations should be made and rectal examinations should be limited. For the operator meeting such a case late in labor with long ruptured membranes and previous vaginal examinations with elevation of temperature and pulse, the viability of the fetus and a critical scrutiny of the situation will guide the selection of operation.

Waters Operation

In the potentially infected case, the low cervical or extraperitoneal (Waters) operation, may be chosen, in the actually infected case the choice lies between extraperitoneal (Waters) operation, the Porro operation, and craniotomy on a living child; this latter operation while one abhors its performance, must in some instances be of choice. Much depends on the skill as well as on the judgment of the operator. Intra-uterine infection may develop so rapidly after rupture of the membranes that early consultation should be asked for in this situation if any suspicion of contracted pelvis exists.

The danger of transperitoneal operation in prolonged and obstructed labor from contracted pelvis is strongly pointed to in the 19 deaths from sepsis in the 22 classical cesarean sections.

That seven of twelve women, on whom low cervical sections were performed in this group, died of sepsis is indicative of the limitations of this operation. It is no panacea against infection, and its choice must always be weighed against the Porro operation if infection is present. The sulfa group of drugs may be added after low cervical section, but they, too, sometimes fail to carry the case through successfully.

In both instances where craniotomy was used as the operation to deliver other methods had failed. Version was the operation of delivery in but one case in this series, high forceps had failed. The patient admitted to the hospital after a home labor of 60 hours was a 215-pound negress who gave a history of several previous stillbirths and two high forceps deliveries, of living children, one child survived, the other was an early neonatal death. Here the fetus was dead and the choice of version over craniotomy subjected the woman to the danger of rupture of the uterus as well as to infection from which she died shortly.

Obese Women

Matthews has stressed the bad prognosis of pregnancy and labor for the obese woman. Particularly, should this fact be borne in mind where contracted pelvis enters the picture. Such cases demand exacting study and the best obstetric judgment available. In the same category I regard the woman with a borderline pelvis who has produced a living child, and does not become pregnant again for a long term of years. In both the obese woman and such elderly secundigravida I look on borderline disproportion as an indication for elective cesarean section near term.

The question of operating on a case long in labor with a contracted pelvis calls into consideration both preparation and anesthesia. If the woman shows signs of becoming exhausted, rising pulse rate and fever, operation should be postponed until a period of rest has been obtained by morphine. During this time acidosis may be combated with infusions of dextrose and the patient's resistance increased by infusions of plasma or blood transfusions. If infection is potential or present, a sulfa drug may be adminis-

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tered by injection as a prophylactic measure. Its local and oral use should be the rule following any intra or extra-peritoneal operative delivery after prolonged labor particularly if the membranes have been long ruptured or vaginal examination made.

No patient should be operated upon if her condition is such that the added shock of the operation will throw the balance of the scales against her. Delay here is fully justified if measures are instituted to overcome shock from exhaustion. The tendency of the uterus to fail to retract and contract after prolonged and ineffectual labor should be borne in mind. The tired muscle does not respond well to oxytocics even when they are administered intravenously. Packing should be available, and used on the slightest suspicion that the uterus will not contract. Post-operatively, blood transfusions or plasma infusions should be the rule.

Anesthesia

The question of anesthesia in this group of cases is important. Nitrous oxide anesthesia was believed to have added to the patient's burden in a number of the cases reported. Open drop ether is regarded as much less unfavorable than other types of anesthesia. In several of the cases barbiturate sedation had been used and was regarded, on analysis of the cases, as having contributed to the physical depression which culminated in fatal shock during or after operative delivery.

The subject of contracted pelvis causing prolonged labor with fatal result cannot be concluded without mentioning multiple operations for delivery. There were fourteen such cases. They reflected largely obstetric inexperience and incompetence.

Occipito-posterior or transverse position or other errors of flexion or rotation, such as brow and face, were the basic causes in prolonging labor in forty-four cases (21.3 per cent) in this series; eleven of the sixty multiparas. The average duration of these labors was fifty hours. (Table VIII.)

Errors in rotation and in flexion, usually associated, are common causes of prolonged labor in both primigravidae and multiparas. Labor is prolonged in occipito-posterior presentations because rotation to the anterior position takes a longer time, while the force of the uterine con-

TABLE VIII. TYPES OF DELIVERY AND CAUSES OF DEATH IN CASES WHERE LABOR WAS PROLONGED FROM ERRORS IN ROTATION AND FLEXION
Forty-four Cases (includes two face and one brow)

	No.	Sepsis	Shock	Hemorrhage	Other
Classical section	5	4	1		
Cervical section	2	2			
Forceps	21	8	7	5	1
Version	9		8	1	
Craniotomy	3	1	1	1	
Spontaneous delivery	4	2		1	1
Multiple	11	3	6	2	

tractions along a posteriorly placed fetal axis causes extension of the head. Thus longer diameters of the fetal head are presented and create a relative disproportion of a temporary nature. Secondary failure of the head to reach the lower uterine pole does not allow the usual stimulating effect resulting in reflex uterine contractions. This interference with adaptation favors an ineffectually contracting uterus with slowly dilating cervix commonly seen in occipito-posterior presentations.

Rest

Time, the guardian angel of obstetric practice, with alternating periods of rest and stimulation, will usually produce the necessary flexion with smaller diameters, descent of the vertex to the sloping planes of pelvic fascia and anterior rotation. The prolongation of such labors may be regarded as a physiological feature of the mechanism. Morphine for rest, atropine for its relaxing influence, a tight abdominal binder, empty bladder and rectum, posture, lying on the side opposite to the fetal back and easily assimilable food may be used with advantage. An eight-hour rest may be followed by the stimulating effect of strong coffee, and very occasionally one or two doses of one minim of obstetrical pituitary extract. Such alternating periods of rest and work will suffice for spontaneous delivery in the majority of instances.

Pathological prolongation of labor occurs when failure of rotation persists or is incomplete, as in transverse arrest, and the uterus is not sufficiently able to complete the task. Manual rotation

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and forceps delivery is indicated in many such cases. Forceps should not be used until complete dilatation has occurred, nor to rotate an occiput which is posterior or transverse if manual rotation can accomplish the same purpose.

Where the pelvis is known to be an AP oval or male in type, delivery by forceps and deep episiotomy with the occiput remaining posterior is less traumatic than instrumental rotation of the head. Version is favored for persistently high head, where flexion is still incomplete and with proper regard relative to cephalo-pelvic proportion, presence of amniotic fluid, the condition of the retraction ring, and the quality of the uterine muscle tone. A properly administered deep ether anesthesia is essential while the use of adrenalin solution for its relaxing effect on the uterine muscle is often helpful. It has been well said that the successful handling of occipito-posterior presentations is a mark of one's having mastered the art of obstetrics.

Classical cesarean section was resorted to in five of the series. In this group pelvic measurements were normal, the infants did not weigh above 3200 grams (7.5 pounds) and two of the women had previously borne living children. There did not seem to be any greater indication for the operation than the fact that the labor was prolonged and the patients exhausted. The dangers of infection in long labors is again shown by the fact that four died of puerperal sepsis.

Low cervical section was used after labor had persisted for forty-eight hours in two patients where occipito-posterior was the cause of prolonged labor; both died of sepsis. Whether or not any vaginal antisepsis during these long labors would have helped is speculative. Sulfanilamid was not used in either case.

Shock

In this group eight deaths following version were attributed to shock. An analysis of the histories showed that in six cases forceps operations had failed to deliver, to one of these a craniotomy had been added, but this, too, failed. Four women, possibly a fifth, had ruptured uterus. In only two cases was the labor less than 36 hours, in the majority it was over 48 hours. There can be little doubt that traumatic overpowering the resistance of a pathological retraction or contraction ring occurred in the majority of the versions in this group. The solution of

TABLE IX.
Large Baby: Twenty-three Cases

	No.	Sepsis	Shock	Hemorrhage	Toxemia
Classical section	5	3	2		
Cervical section	1	1			
Porro section	1	1			
Forceps	9	2	3	3	1
Version	5	1	4		
Spontaneous delivery	2		2		
Multiple operation	4	1	3		

Hydrocephalus: Three Cases

Classical section	3	2	1		
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Breech: Seven Cases

Extra-peritoneal section	1	1			
Decomposition and extraction	3	2	1		
Spontaneous delivery	3	2		1	

Twins: Three Cases

Version	2	2			
Forceps	1	1			

Transverse Life: Two Cases

Porro	1	1			
Version	1	1			

such situations is early and competent consultations. When forceps fail and version is contraindicated the Porro operation with extraperitoneal fixation of the stump in infected cases appears the logical final operative procedure.

Oversize Babies

Large babies, 8.5 pounds, 3800 grams, or over, hydrocephalus or twins was the basic cause of prolongation of labor in thirty-eight cases (18.5

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per cent), of the series; seventeen of the sixty multiparas. The average duration of labor was forty-four hours. As in the other groups sepsis and shock were the major causes of death. (Table IX.)

Excessive size of the fetus may produce dystocia and prolonged labor through a relative disproportion between the head or shoulder girdle and the pelvis. As a rule, obstruction is infrequent in the average pelvis with a fetus weighing less than ten pounds (4500 grams). In such cases the pregnancy has usually been prolonged, the fetus is postmature and the head does not easily mould. In many instances the size of the shoulder girdle causes the real difficulty in delivery.

An oversized baby is likely if the parents are unusually large physically, the mother a grand multipara or a diabetic. If prenatal examination reveals this a prolonged or difficult labor may be anticipated. Induction of early labor has been suggested if examinations portend a child of eight pounds (3600 grams). In actual labor the same criteria as in contracted pelvis should hold for time and type of operation.

In a case carefully watched from beginning of labor in hospital, with unruptured membranes, vaginal antisepsis, no vaginal examinations, failed test of labor with an oversize fetus may be followed by classical cesarean section. As the objections to this operation are listed one by one, the shift should be to low cervical extra-peritoneal or Porro section or craniotomy. Version must be thoughtfully and cautiously chosen as an operation to deliver when forceps fail; the few living children so delivered are outweighed by the maternal deaths from ruptured uteri and shock. It should be recalled in connection with this group of cases that the multipara who has previously borne very large babies reaches a point in her uterine ability and physical capacity where she can no longer be capable of such a strain of labor as may be allowed a younger or primiparous woman.

There were eleven deaths from shock among the twenty-three large baby cases. The length of labor predisposed to this mode of exitus; the choice of gas oxygen anesthesia in three cases was unwise. Of the twenty-three babies in the excessive size group but six were born alive. Ten of the babies weighed from nine to thirteen pounds.

Pathologically prolonged labor may result from hydrocephalus. Antepartum diagnosis was not made. The treatment by cesarean in all three cases even though two of the patients were multiparas, with more than forty-eight hours labor in each case, signifies either missed judgment or unusually extenuating circumstances which did not appear in the history. Reduction of size of head through perforation usually results in spontaneous delivery.

Breech Presentation

Breech presentations are frequently associated with prolonged labors. The extension of time to deliver is not always abnormal. The basic causes of breech presentation are those factors which tend to prevent the breech from easily entering the lower uterine ovoid and causing reflex stimulation. The frank breech enters the pelvis, it is true, but its progress is impeded by lack of lateral flexion from the splinting action of the legs. Such labors may become pathologically prolonged. All diagnosed or suspected breech presentations should have roentgenograms to determine the exact relation of the legs to the fetal body.

Regarding delivery of breech presentation, the radical obstetrician feels that extraction should be done as soon as the cervix is fully dilated, the conservative man feels the breech should be allowed to deliver spontaneously, if possible. The middle ground of interfering when lack of progress has been determined by close observation of the case is the best obstetric practice.

Inertia Uteri

Inertia uteri and other dystocias of soft parts were the basic cause of prolonged labor in forty-four cases (21.3 per cent) of the series; twelve of the sixty multiparas. (Table X.)

Inertia uteri is a frequent cause of prolonged labor. Clinically, two types of inefficient and ineffectual muscular efforts at expulsion are seen. The primary type is present throughout labor from its onset; the secondary type, often confused with the cessation of contractions from general exhaustion of an obstructed labor, develops after a variable length of labor either of the normal or of the primary inertia type and signifies that the uterus in question has been capable of only so many hours' effort, and that

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TABLE X.
Inertia Uteri: Thirty-seven Cases

	No.	Sepsis	Shock	Hemorrhage	Other
Classical section	3	2		1	
Forceps	19	8	5	5	1
Version	3	1	2		
Craniotomy	1	1			
Spontaneous delivery	10	4	1	4	1
Undelivered	1		1		
Multiple	1	1			

Fixation of Uterus: Two Cases

Porro section	1	1			
Version	1	1			

Stenosis of Cervix: Three Cases

Cervical section	1	1			
Undelivered	1	1			
Forceps	1	1			

Fibromyomata Uteri: Two Cases

Classical section	1	1			
Forceps	1			1	

usually of a poor degree. Among the reasons suggested for inertia are faulty development of the muscle, poor constitutional types, abnormal innervation of the uterus, the worn out muscle of the multipara or the over-distended muscle of the twin or hydramnion pregnancy.

A common cause might be the altered wall of the previously infected uterus or early fibrosis in the uterine muscle of the elderly primigravida. Malnutrition may play a more significant rôle than we suspect, a woman who has had an excellent protein intake during pregnancy seldom has inertia during labor. I am unconvinced of benefits, per se, from prenatal administration of calcium or quinine or the use of a low salt diet. To me these cases are as difficult to anticipate as they are to treat. I regard them as pathologically prolonged labors since the basic cause is an abnormal condition.

From the unusual degree of pain associated with the inefficient contractions of inertia the factor of abnormal innervation appeals greatly. If the patient's morale can be controlled and supported by periods of rest under morphine and easily assimilable food, periods of alternate effort will eventually increase in intensity to the point where delivery becomes feasible by operation, if not it does occur spontaneously.

Secondary inertia, on the other hand, leaves one in a quandary of whether to attack or retreat, to stimulate, operate or sedate. Decision must depend on such factors as length of labor, condition of the mother and fetus, and degree of dilatation and descent of the presenting part. Rest under morphine and support of intravenous dextrose brings out reserve strength. Further periods of rest may be advisable before resorting to operation.

Artificial shortening or termination of the first stage, here or where other basic causes obtain, calls for mature judgment, a high degree of obstetric skill and favorable environment.

Dilatation of the cervix may be accomplished by an insertion of a bag. If dilatation is indicated to permit immediate operative delivery, cervical incision should be made.

Forceps delivery is most favorable. Cesarean section is seldom indicated. One of the three cesareans in this group had a pathological retraction ring after a 67-hour labor. Failed forceps, failed version and septic death after cesarean with a stillborn child points to missed opportunity at an earlier hour, or absence of judgment in not choosing a craniotomy or embryotomy on a dead fetus. The forceps series here emphasize the surgical axiom not to operate in shock or its premonitory exhaustion.

Cervical Dystocia

Other types of soft tissue dystocia in this group of 206 fatal cases were associated with prolonged labor. (Table X.)

Much has been written in regard to the part the cervix plays in producing a prolongation of labor. In most instances the failure of obliteration and dilatation of the cervix is dependent upon processes taking place in the lower uterine segment and in the corpus. In only a few cases is the fault inherent in the cervix itself.

A. C. Ivy has summarized the delay in the first group as being due to, first, an incoördination

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tion of the wave of contraction; secondly, to a failure of the property of the uterine muscle fibers responsible for retraction in taking up the "slack," or holding the progress made by the

There was a history of previous induced abortion. Death resulted from intrapartum sepsis, undelivered. The third case, a syphilitic negress, had a nonyielding external os. For sixty of the

TABLE XI. TOXEMIA AND NEPHRITIS
Twenty-two Cases

	No.	Sepsis	Shock	Hemorrhage	Toxemia	Heart
Classical section	3	1	1			
Forceps	8	4			4	
Version	4	3	1			
Spontaneous delivery	6	3			3	
Undelivered	2				1	1

preceding contraction; and thirdly, failure of engagement or descent of the presenting part in the pelvis causing a loss of force of the contractions in effacement and dilatation. The first two ideas support the view expressed by Kamperman that the progress noted in the cervix reflects the effectiveness in labor of the uterus as a whole.

Ivy considers four factors resident in the cervix may be responsible for its failure to dilate normally. There are: first, failure of the isthmus to completely unfold and be included in the general uterine cavity after three or four months of pregnancy. This results in a long cervix at term. Secondly, failure of the circular musculature about the obstetric internal os to manifest normal relaxation. The reason for this hypertonus or spasticity is obscure. Thirdly, failure of the external portion of the cervix to soften in the normal manner in response to the sex hormones. Fourthly, the presence of an abnormal amount of connective tissue due to cervicitis preceding infection or mechanical trauma.

The cervix was definitely incriminated only three times in this series. The women were twenty, thirty, and thirty-four years of age; the labors, sixty, ninety-six, and one hundred and three hours' duration.

In the first instance, a young primigravida, the cervix was noted as being thick and cartilaginous in consistency. Death resulted from sepsis following cervical section. In the second case it was noted that a hard, stenotic ring was present about one inch above the external os.

103 hours the head was on the pelvic floor. When dilatation finally occurred low forceps completed the delivery. Death from sepsis followed; at autopsy perforation of the lower uterine segment from pressure, necrosis was found. The case seems to have been a typical one for cervical incisions.

The few cases where cervical dystocia was present in this series is of interest when one recalls that in the recent maternal care study in Michigan the average finding of rigid cervix in labor reported by all attendants was given as 6.4 per cent, and that manual dilatation or incision was practiced in 5.3 per cent of all cases reported. In the hospital series, 3 per cent of the labors were considered prolonged because of a toxemic state of the woman; in the mortality group there were twenty-two labors with toxemia as the basic cause of delay, 10.7 per cent. The average duration of these labors was sixty hours. (Table XI.)

Toxemias

Dieckmann, in his recent monograph, states that 35 per cent of all toxemic primigravidas have labors over eighteen hours and 25 per cent have labors over twenty-four hours. It is to be presumed that the depressing constitutional effect of the toxemias of pregnancy of any type would have a modifying effect on the uterine musculature. The question as to the proper time and manner of terminating pregnancy in toxemic women is an old one and it will not be debated in this paper except to say that the obstetric fac-

PROLONGED LABOR—WILLIAMS

tors of parity, period of gestation and the physiological preparedness of the cervix, consistency, obliteration and dilatation should always be borne in mind. Primarily the severity of the toxemia and failure of its improvement under treatment are guiding influences.

The tendency to an instability of the vascular and metabolic systems, to an inertia induced by toxemia, to a lack of resistance to infection and to an inability to withstand traumatic vaginal operative deliveries favors the choice of many obstetricians today of promptly terminating toxemias of increasing severity, especially, in primigravidas, by hysterotomy under local anesthesia.

Ten of the twenty-two labors were induced by rupture of the membranes, insertion of rubber tubes into the uterine cavity or insertion of gauze packs into the cervix. The three cesarean operations followed induced labors.

Multiple operative procedures are not well tolerated in progressively increasing toxemias. While the danger of infection introduced by tube induction makes classical cesarean an operation fraught with risk, all these cases showed such faults as lack of prenatal care, refusal of hospitalization by the patient, use of chloroform and nitrous oxide anesthesia and the use of pituitary extract in labor, with probably two instances of pituitary extract induced fatal vascular collapse.

Placenta Previa

Three cases of placenta previa gave rise to labor of over twenty-four hours each. With the onset of uterine contractions hemorrhage occurred in all until at admission to hospital, one woman died of shock undelivered and the other two survived version and extraction for two and twenty-five minutes respectively. The location of the implantation may have hindered more effectual labor in preventing engagement of the fetal head. In all three cases missed diagnosis was a basic error. (Table XII.)

In eight cases medical or surgical conditions were responsible for prolongation of labor through the toxic or depressing effects of infections such as pneumonia, tuberculosis and pyelitis. Other anomalies producing prolonged labor included one case of rupture of the uterus at seven months pregnancy. The final case in this series was one where an acute intestinal obstruction developed during labor in a primigravida. The labor lasted seventy-five hours, and ended in a

TABLE XII.
Rupture of Uterus: One Case

	No.	Sepsis	Shock	Hemorrhage
Evacuations of uterus	1	1		
<i>Placenta Previa: Three Cases</i>				
Version	2			2
Undelivered	1			1
<i>Medical Conditions: Eight Cases</i>				
Pneumonia	3			
Tuberculosis	2			
Malnutrition	1			
Intestinal obstruction	1			
Pyelitis	1			

spontaneous delivery of a living child. There were no basic obstetrical causes for a long labor. Immediately after delivery, an intestinal resection was performed. Death resulted on the third day, postpartum and postoperative. Though extremely rare, such a case possesses some interesting questions for both surgical and obstetrical judgment. Should intestinal operation have been performed at once and the labor allowed to go on normally? According to Cosgrove, as I understand his teaching, the latter would be preferable, unless there was an obstetric reason for abdominal delivery.

There were thirty-five cases (17 per cent) in this series in which multiple operations were performed. Fifteen patients died of sepsis, seventeen died of shock, three died of hemorrhage. Many of the histories of this series reflect obstetric inexperience or incompetence. The greater likelihood of the woman with a prolonged labor to become infected, is increased with repeated intra-uterine manipulations.

The shock-producing effect of the physical and mental strain of long labor is accentuated by multiple operative procedures. In this series the most frequent combination of operations was failed forceps and version, or failed forceps and cesarean section. Judgment and skill, borne of long obstetric experience, are the solutions to such termination of prolonged labors.

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Rupture

There were fourteen cases of rupture of the uterus, approximately 7 per cent, in this series. Rupture of the uterus followed version in nine instances, in another case it followed attempted version, after failed forceps, and final craniotomy. Here, it was felt the attempt at version was responsible. Three cases of rupture of the uterus followed forceps deliveries. The rupture following forceps were in the lower uterine segment and were likely due to unskillful insertion of the blades or to trauma of forcibly overcoming disproportion. Among the contra-indications for version, as seen in many of these cases, was the presence of a tetanically contracted uterus or a pathological retraction ring. These are most emphatic contra-indications.

A discussion of this subject cannot be closed without a comment on fetal wastage. Death rate of the fetus or newborn in prolonged labor, from whatever basic cause, is high, and results from asphyxia, anoxia or direct injury. In this series eighty infants were stillborn, nine women died undelivered (a postmortem abdominal hysterotomy salvaged one survivor in this group) and fourteen neonatal deaths were recorded. The total, 102 infant deaths, is approximately fifty per cent of the total series. Among the sixty-six cesarean sections, of all types which were performed, fifteen babies were stillborn. It is evident that the tardy recognition of the basic causes of prolonged labor and delay in instituting properly chosen procedures to deliver takes a tremendous fetal toll.

Summary

Labor may be prolonged beyond the average duration by various abnormalities of the three factors concerned in its mechanism. Depending upon the extent of the fault the prolongation may be regarded as physiological or delayed or it may develop into a true pathological status.

If the delay is due to contracted pelvis, oversized fetus, or errors of rotation and flexion the basic cause should have been recognized antepartum. The delay should have been anticipated and the management of the case planned long before any arbitrary time limit. Consultation, required in many institutions, by providing competent obstetric judgment, will help in determining the proper course to pursue in unplanned cases or unrecognized situations.

MAY, 1943

Women die after prolonged labors not so much from the cause producing the delay but due to faulty management of the labor. Deaths result from infection, exhaustion and shock, and hemorrhage. Infection can be combated by vaginal antisepsis, keeping up resistance, choice of proper operation to deliver, asepsis and skilled technique in delivery and the use of the sulfa group of drugs.

Exhaustion may be avoided by rest induced by morphine and the supporting influence of infusions of dextrose. These measures tend to lessen shock. The avoidance of multiple operations and tissue devitalization can be accomplished through choice of proper operation. This demands mature obstetric judgment and skill. The choice of anesthetic agent is highly important.

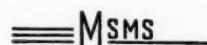
Hemorrhage is lessened if tonicity can be restored to the uterus before delivery. The third stage is best managed in as near a normal mechanism as possible. When oxytocics fail to produce contraction and retraction in a tired uterus, intrauterine tamponade is imperative, and fluid and blood replacement is of the first order.

Inertia uteri constitutes both a medical and an obstetrical problem. Purposefully allowing labor to be prolonged uniformly gives better results than too early stimulation or operation. Intelligent, watchful waiting must not, however, become unintelligent hopeful expectancy.

Cervical dystocia is rare. Where it is definitely present, radical intervention may at times be indicated.

Toxemia predisposes to prolonged labor through its reflex influence on the organism as a whole. In many instances hysterotomy is less traumatic to both mother and fetus than long and operatively terminated vaginal delivery.

A recital of the circumstances surrounding maternal deaths associated with labors of more than normal duration by the attending obstetrician before a medical group followed by a frank and open discussion of such facts has proven in Philadelphia to be a salutary method of diminishing the incidence of such tragedies.



May 24, 1943, is the four hundredth anniversary of Nicholas Copernicus, the great Polish astronomer. Few know that he was by profession a Doctor of Medicine. The Kosciuszko Foundation is celebrating at Carnegie Hall, New York, and has issued a beautiful illuminated booklet on the life and accomplishments of Copernicus.

EDITORIAL *

FUTURE OF MEDICINE

■ For the past several months the future aspects of the practice of medicine have been clouded by many signs pointing to changing conditions. Some of these have been for more control of our private practice in the way of restrictions or regimentation, but the most dangerous trends have been towards relaxation of our standards under which the people of the United States have received the best medical service ever offered. Most of these changes have been by executive decree or court order, and they have pointed towards state medicine. The Court refused to decide whether we are a profession, but declared our medical societies must not interfere in any way with the BUSINESS of furnishing medical services by a group or organization to its members or subscribers. The medical societies tried to so arrange that the subscribers could choose their own doctors, but the court said that is illegal, and the medical societies must not interfere in any way with the "Business" affairs of the groups. To be interested in the terms of contract or qualifications of the contract physicians is prohibited. This prohibition of activities opened the way for Social Security to announce a plan for care of the people "from the womb to the tomb," with a ten per cent deduction of income. As a matter of fact that proposal came immediately the Court's decision had been published. Most of us know something about the Beveridge Report, in England, proposing a rather complete coverage for medical and health services, for all the people. The English plan exempts certain services saying that private enterprise had already done a good job.

The Armed forces have ordered into service all teen-agers who have commissions, or ratings, and are in school. All others are being inducted. They will be placed in uniform and selections made for continuation of school training. The armed forces will determine who is to take premedical courses, dentistry, or theology. The soldier will not be allowed to choose his school, but may be consulted as to the profession if

any he desires to choose. He will then be sent to school with quarters and subsistence, tuition, and a basic soldier's pay, under commanding officers and marched to classes. The three-year premedical course now required by twenty-three states is cut to five twelve-week sections and that telescoped into fifteen months. Those states can change their registration law! Under present laws these student will not be able to take the examinations and practice,* but there is a way out of that. The United States Public Health Service can issue commissions and they can practice in any state of the union.

These several instances of government by decree have provoked worries among thinking doctors and medical leaders in many of our states, and editorial comments are numerous.

THE OUTLOOK IMPROVES

■ Signs are in development that there may be some semblance of other and more democratic control. The House of Representatives, and the Senate have both voted against the decree of the President about the \$25,000 net after federal taxes. This was proposed and rejected twice by the congress, according to able Editor Grove Patterson in the *Toledo Blade* of March 18, 1943: "That is a wholesome sign of a returning sense of responsibility by the legislatures for legislation. For too long a time Congress refused to accept that responsibility. That is why there has been so much legislating from the White House, by decree."

There are many signs that the Congress is again assuming the direction of legislation. A resolution has been prepared directing the President to assume leadership in the creation of a supreme war council. The Ways and Means Committee turned down the "skip a year" income tax plan, but Congress seems to be determined to do something about it. The Powers-

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*"The admission of these graduates to private practice after the war will require consideration on a state level and legislation as needed." Brig. Gen. Joseph M. Dalton, Army Personnel Section at National Conference on Medical Service, Chicago, February 15, 1943.

Winning the War—At Home and Abroad

The membership of the Michigan State Medical Society stands today at 4,445. This large enrollment includes 1,663 military members. These self-sacrificing, courageous Doctors of Medicine, as officers in the Medical Corps of the Army and Navy, are serving their country in all parts of the world. Of these members, we are mighty proud. We wish them Godspeed and an early return to Michigan with Victory 'round their shoulders!

Praise is also due those physicians who must remain on the home front. These Doctors of Medicine are working two and three times harder than ever before to see that medical service is supplied to our industrial and civilian population. They are not sparing themselves but actually shortening their lives by over-work and the pressure of anxiety. Because of their contribution medical care is being received by our war workers and all who need it. The excellent health of the people of America—the best in the nation's history—speaks in a great voice of the splendid labors being done by our medical army at home.

Michigan Doctors of Medicine know that a war must be won. Their work, whether among the dangers of the armed forces or in the triple-quick practice of medicine in their own communities, is all to that end.

A cursive signature in black ink, appearing to read "N.H. Cummings".

President, Michigan State Medical Society



President's



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that-be have consistently refused to consider women doctors for commissions in the armed forces, but a bill has just been passed granting them commissions, to be equal to the men's, and with the same pay.

It has taken forty years to build up a highly educated and wonderfully trained medical profession, and to set up laws providing and guaranteeing the very best for the care of our people. This is a progress unequalled anywhere in time or place in history, and an achievement for which our predecessors, and contemporaries may well be proud. We are not ready to see even one little bit of this progress lost by executive decree. If by legislation, or court decision, we must submit; but we will have our protest. Chairman Walter F. Donaldson of the American Medical Association's Public Relations Committee told us to not give up lightly even for a supposed temporary advantage the things we had built by so many years of endeavor. That is sound advice, and if the medical profession will adhere to it, the future will be good.

From the standpoint of training, and practice, research and advancement of techniques we can look forward with confidence, and this writer believes the sound judgment and sterling qualities of leadership inherent in the profession will surmount any obstacles that may present themselves. The profession has weathered many storms in the past, and always to its own betterment, as well as great advantage to the people whom we serve. The same thing will happen as the result of this time of trial. We must have many changes as a result of the world revolutionary times through which we are passing, and some of those changes will be radical. But if we take a hand in the shaping of those changes they will at least be our own handiwork.

Above all we must not go backward, and with courage and conviction, with everyone helping, we WILL go forward.

WOMEN DOCTORS COMMISSIONED

■ The press has announced the passage of a bill giving commissions to women doctors. Our women physicians have been striving for this for many years. During the other war they thought they should be granted commissions, and some of them served as contract surgeons in the army, acting in hospitals, giving anesthetics, etc. One

of our Michigan women doctors served overseas (Bertha Davis Orr, M.D., now of Flint).

It is only proper that this step should be taken, and especially after giving nurses commissions. There will probably not be many women doctors commissioned, but some will, and it is fitting. They practice side by side with the men in everyday life, and while some will think they may be handicapped, still they have made themselves successful, and no mean competitors. They should be recognized in the armed forces, and they have just as many rights as women in any other occupation. We have commissioned WAACS, WAVES, Nurses. Why not doctors?

SELECTIVE SERVICE EXAMINATIONS

■ National headquarters of Selective Service System has issued Medical Circular, Number 3, dated March 1, 1943. This is a modified listing of the defects for which selectees are to be rejected—that is, placed in 4F rating, at the preliminary examination by the draft board examiners. There are some changes from the screening circular under which these examinations have been conducted for several months. The circular stresses that the examinations must be made *in the nude*, and that "enthusiastic acceptance by the examining physicians is essential to the program." Col. L. G. Roundtree in his letter of transmittal to the editor says:

"As you know, the demands on the medical profession are unbelievably great and the number of doctors entering the military service very large. Since Pearl Harbor the quotas have been increasingly large, thus the number of men to be examined each month is in proportion. Under the circumstances it is impossible for the examining physicians of Selective Service to carry out the complete physical examination on all registrants.

"Selective Service is much impressed with the devotion and the patriotism of its examining physicians and dentists. As you no doubt know these professional men in Selective Service are making the preliminary examination of registrants who are to be inducted into all branches of the military service. This represents a national service of great magnitude and importance."

The medical profession has done a tremendously important service in making all these examinations. Many of them have been done the hard way, by individual effort, but most boards have made examinations by groups, each man

EDITORIAL

seeing all the men to be examined, and making the observations in the fields assigned to him. In the communities where most of the active doctors have gone to service that is the only possible way, and that is still a burden. The profession has never shirked a patriotic duty, however, and will carry on.

POSTWAR PLANNING

■ Mr. Charles F. Kettering spoke at the dinner following Michigan's Postgraduate Industrial Medical and Surgical Conference, April 8, 1943, calling especial attention to some postwar problems. He said human nature does not change in two years, even of war, what it has taken two million years to build. He said:

"Given a point in this long history of the race, such as the present era, the really valuable thing we can do is to know ourselves better, and know each other better, as we now are.

"The difficulty with you doctors is that you have allowed an amazing mass of advertising about miracle medicines and cures to grow up about you, but you have drawn into your shells and neglected to let the people know what you really are and what you are doing.

"I should like to see a text book on the history of medicine, relating the marvelous achievements of medicine, put into the schools.

"The laity does not know you, and your patients are generally afraid of you, because they do not understand what you are doing to them, or why.

"I would like to see hospitals made over into real centers of sociability and I think every person should know some doctor who is not doctoring him, to get acquainted with doctors as persons and find out what is in their minds.

"To me the great thing coming out of this conference today is the opening of your minds to each other."

The Conference was sponsored by The Committee on Industrial Health, Michigan State Medical Society, in coöperation with The Department of Postgraduate Medical Education, University of Michigan. It was attended by over 400. Similar conferences are being held in many states, and are accomplishing a great work during the present Industrial Medicine rejuvenation.

POSTGRADUATE FOUNDATION

■ A new War Financing program is in progress involving the sale of thirteen billions of dollars of War Bonds. Our members will buy many of these Bonds, and should buy every one possible. We have a war to win and for those of us at

home purchasing Bonds to the limit is no hardship in comparison to what our brothers have and are doing. And while buying these bonds why not send one to the Michigan State Medical Society Foundation for Postgraduate Medical Education. This Foundation has been established by the society during the past year and has already received donations. When buying Bonds our members who wish could make their money do a double duty. Help win the war and help make the postwar period more secure.

STOP! LOOK! LISTEN!

So far, we have tried to urge doctors voluntarily to move into the areas where shortages are acute. This, however, proved an unsuccessful method in Great Britain, and I am afraid we shall make the same discovery. In many cases, organized medical groups have been the stumbling block. Doctors who have gone into the services and given up practices they have built up sometimes have not wanted them taken over by other young men while they are gone.

Men who have lucrative practices do not want to move into an area which may need them badly, but which will give them inadequate income and, frequently, an impossible housing problem for their families. County medical societies and other groups have opposed, in many cases, anything which savors of Government control, and at times even the sending of public health doctors.

These doctors, as a rule, are sent only in case of emergency or disaster. It looks to me, however, as if the health needs of the civilian population may force us to abandon our volunteer system and to submit to mandatory placement for the duration of the war.

—ELEANOR ROOSEVELT, "My Day," May 1, 1943.

Procurement and Assignment has been sending Doctors of Medicine into areas of need, and of emergency for several months, and has done a rather good job. Many men have been replaced in Michigan. There is still some need, and places for more men to be resettled. This has been a strictly voluntary effort, has met with universal approval, and has assured medical care. In cases of disaster there never was a time that all doctors needed have not immediately volunteered.

Our voluntary system has sufficed so far, and will do so to the end of the War Emergency, but we look forward with misgivings to MANDATORY placement. American medicine will prove itself adequate to this unprecedented call if allowed to solve its own problems. Mandatory methods will increase confusion.

Michigan State Medical Society

Roster 1943

[An "M" following a name indicates active military service]

Allegan County

Beckett, M. B.	M	
Benning, H. M.		Allegan
Brown, Lewis Freeman	M	
Dickinson, C. A.		Wayland
Dolfin, W. E.	M	
Flinn, C. C.		Allegan
Hamelink, M. H.		Hamilton
Hudnutt, Orrin Dean		Plainwell
Johnson, E. B.		Allegan
Johnson, H. H.		Martin
Mahan, James E.		Allegan
Medill, W. C.		Plainwell
Ramseyer, Gladwin E.		Plainwell
Shepard, C. Lyle		Otsego

Stuch, Howard T.	M
Stuck, Olin H.	Otsego
Vaughan, W. R.	Plainwell
Van Der Kolk, Bert	Hopkins
Van Ness, J. H.	Allegan
Walker, Robert J.	Saugatuck

Alpena County

Bunting, John W.	Alpena
Burkholder, Harry J.	Alpena
Carpenter, Clarence A.	Onaway
Hier, Edward A.	Alpena

Parmenter, E. S.	Alpena
Purdy, John W.	Lachine
Rutledge, S. H.	M
Trudeau, J. M.	M
Wienczewski, Theophile	M

Barry County

Altland, J. K.	M
Finnie, R. G.	M
Fisher, Gordon F.	M
Gwinn, A. B.	Hastings

Lund, Chester A. E.	Middleville
McIntyre, K. S.	M
Morris, Edgar T.	Nashville
Rees, Kendall B.	Dowling
Wedel, Herbert S.	Hastings

Bay-Arenac-Iosco-Gladwin Counties

Alcorn, Kent	Bay City
Allen, A. D.	Bay City
Andrews, F. T.	Lansing
Asline, J. N.	M
Ash, C. W.	Bay City (Ret.)
Austin, Justis	Tawas City
Baker, Charles H.	Bay City
Ballard, Sylvester L.	Bay City
Ballard, W. R.	Bay City
Bouloton, A. O.	Bay City
Brown, G. M.	Bay City
Connelly, C. J.	M
Criswell, R. H.	Bay City
Dardas, M. J.	M
DeWaele, Paul L.	M
Drummond, Fred	Kawkawlin
Dumond, V. H.	Bay City
Foster, L. F.	Bay City
Freel, John A.	Bay City
Gamble, W. G., Jr.	Bay City
Gronemeyer, W. H.	M
Groomes, Charles	Bay City
Grosjean, J. C.	Bay City
Gunn, Robert	Standish
Hall, R. F.	M
Hagelshaw, G. L.	M
Hasty, Earl	Whittemore
Healy, Gaillard H.	Bay City
Hess, C. L.	Bay City
Heuser, Harold H.	Bay City
Horowitz, S. Franklin	M
Huckins, E. S.	Bay City
Hughes, E. C.	Bay City
Husted, F. Pitkin	M
Jacoby, A. H.	M
Jens, Otto	Essexville
Jones, Jerry M.	Bay City
Keho, John	Bay City
Kerr, Wm.	Bay City
Kessler, Mana	Bay City
Kessler, S.	Bay City
Knobloch, Howard	M
Lane, Milton	M
Lerner, David	M
McDonnell, Walter R.	M
McEwan, J. H.	Bay City
MacPhail, Joseph	M
Medvesky, M. J.	M
Miller, Edwin C.	M
Mitton, Orland W.	East Tawas
Moore, George W.	Bay City
Moore, Neal R.	M

Mosier, D. J.	M
Pearson, Stanley M.	M
Perkins, Roy C.	Bay City
Reutter, C. W.	M
Riley, R. B.	M
Scrafford, Royston Earl	Bay City
Shaffer, H. C.	M
Sherman, R. N.	Bay City
Slattery, M. R.	Bay City
Smith, William Marshall	Bay City
Staley, Hugh	Omer
Stinson, W. S.	Bay City
Stuart, Kenneth	Bay City
Swantek, Charles M.	Bay City (Ret.)
Tarter, Clyde S.	M
Timreck, Harold A.	M
Urmston, Paul R.	Bay City
Warren, E. C.	Bay City
Weed, John	East Tawas (Ret.)
Wilcox, J. W.	Bay City
Wilson, Thomas G.	Bay City
Wittwer, E. A.	Bay City
Woodburne, H. L.	M
Zaremba, Aloysius J.	Bay City
Ziliak, A. L.	Bay City

Berrien County

Allen, J. U.	Benton Harbor
Anderson, Bertha	St. Joseph
Bartlett, W. M.	M
Belsley, Frank K.	Benton Harbor
Bliesmer, A. F.	St. Joseph
Brown, F. W.	Watervliet
Brown, Rolland J.	M
Burrell, H. J.	Benton Harbor
Cawthorne, H. J.	Benton Harbor
Conybeare, R. C.	Benton Harbor
Crowell, Richard	M
Eidson, Hazel	Berrien Springs
Ellet, W. C.	M
Emery, Clayton	St. Joseph
Faber, Michael	Benton Harbor
Friedman, Morris	New Buffalo
Gillette, Clarence H.	Niles
Hanna, P. G.	St. Joseph
Harper, Ina	Benton Harbor
Harrison, L. L.	Niles
Hart, Russell T.	Niles
Henderson, Fred	Niles
Henderson, Robert	Niles
Herring, Nathaniel A.	Niles
Hershey, Noel J.	M
Huff, H. D.	Niles
King, Frank A.	Benton Harbor
King, Frank, Jr.	M
Kling, H. C.	Niles
Kok, Harry	Benton Harbor
Leva, John B.	M
Littlejohn, Wm.	Bridgeman
McDermott, J. J.	St. Joseph
Merritt, Charles W.	St. Joseph

Miller, E. A.	Berrien Springs
Mitchell, Carl A.	Benton Harbor
Ozeran, Charles J.	Benton Harbor
Pritchard, H. M.	Niles
Reagan, Robt. E.	M
Rein, Gerald	Benton Harbor
Richmond, D. M.	St. Joseph
Ruth, J. Griswold	M
Smith, W. A.	Berrien Springs
Sowers, Bouton	M
Spawr, C. V.	Benton Harbor
Strayer, J. C.	M
Thorup, Don W.	Benton Harbor
Waterson, Roy S.	Niles
Westervelt, H. C.	Benton Harbor
Yeomans, T. G.	St. Joseph

ROSTER MSMS

Branch County

Andrews, Frank A.	Coldwater
Bailey, J. E.	Coldwater
Beck, Perry C.	Bronson
Bien, W. J.	Coldwater
Chipman, E. M.	M
Culver, Bert W.	Coldwater
Far, S. E.	Quincy

Schultz, Samuel	Coldwater
Scovill, H. A.	M
Smith, L. Lloyd	M
Thomas, J. A.	Coldwater
Wade, R. L.	Coldwater
Walton, N. J.	Quincy
Weidner, H. R.	M

Calhoun County

Amos, Norman H.	M
Baribeau, R. H.	Battle Creek
Barnhart, Samuel E.	Battle Creek
Becker, H. F.	M
Bonifer, Philip P.	M
Braham, Wilbur	M
Brainard, C. W.	M
Campbell, Alice	Albion
Campbell, R. J.	M
Capron, Manley J.	M
Church, Starr K.	Marshall
Chynoweth, W. R.	M
Cooper, J. E.	Battle Creek
Curless, Grant R.	M
Curry, Robert K.	M
Derickson, E. C.	Burlington
Dickson, A. R.	Battle Creek
Dodge, Warren M.	M
Fairbanks, Stephen	Albion
Finch, D. L.	M
Forsyth, J. F.	M
Frank, David L.	Battle Creek
Fraser, R. H.	Battle Creek
Funk, L. D.	Athens
Gething, Joseph W.	Battle Creek
Giddings, A. M.	Battle Creek
Gorsline, Clarence S.	Battle Creek
Graubner, F. L.	M
Hafford, Alpheus T.	Albion
Hansen, E. L.	Battle Creek
Hansen, Harvey C.	M
Haughey, Wilfrid	Battle Creek
Heald, C. W.	Battle Creek
Herzer, Henry A.	Albion
Hills, C. R.	Battle Creek

Putman, W. N.	Battle Creek
Robbert, John	Climax
Robins, Hugh	Marshall
Rorick, Wilma Weeks	Battle Creek
Rosenfeld, Joseph E.	Battle Creek
Roth, Paul	Battle Creek
Royer, C. W.	M
Schelm, George W.	Battle Creek
Selmon, Bertha L.	Battle Creek
Sharp, A. D.	Albion
Shipp, Leland P.	Battle Creek
Sibilsky, A. Clark	Battle Creek
Simpson, Robert S.	M
Slagle, George W.	M
Sleight, James D.	M
Sleight, Raymond D.	Battle Creek
Smith, T. C.	M
Stadle, Wendell H.	M
Stiefel, Richard	Battle Creek
Tannenholz, Harold S.	Battle Creek
Taylor, Clifford B.	M
Toms, Roland E.	Battle Creek
Thompson, Oliver E.	Battle Creek
Upson, W. O.	Battle Creek
Van Camp, Elijah	Battle Creek
Vander Voort, W. V.	Battle Creek
Vollmer, Maud J.	Moline, Ill.
Walters, F. R.	Battle Creek
Walters, Royal W.	Battle Creek
Watson, Bernard	M
Wencke, Carl G.	Battle Creek
Whyte, Bruce	Battle Creek
Winslow, Rollin C.	Battle Creek
Winslow, Sherwood B.	Battle Creek
Zindler, George A.	Battle Creek
Zinn, Karl	M

Cass County

Adams, U. M.	Marcellus
Clary, R. I.	M
Cunningham, E. M.	Cassopolis
Greene, George S.	Dowagiac
Hickman, John	M

Newsome, Otis E.	Dowagiac
Pierce, Kenneth C.	Dowagiac
Rice, Franklin	M
Swengel, D. H.	Cassopolis
Zwergel, E. H.	Cassopolis

Chippewa-Mackinac Counties

Bandy, Festus C.	Sault Ste. Marie
Birch, Wm.	M
Blain, James G.	M
Blair, H. M.	M
Conrad, George A.	Sault Ste. Marie
Cornell, Eliphilet A.	Sault Ste. Marie
Cowan, Donald	M
Darby, J. F.	St. Ignace

Gilfillan, E. O.	M
Hagele, Marie A.	Sault Ste. Marie
Hakala, L. J.	M
Harrington, H. M.	Sault Ste. Marie
Littlejohn, David	Sault Ste. Marie
McBryde, Lyman M.	Sault Ste. Marie
Mertaugh, W. F.	M
Moloney, F. J.	Sault Ste. Marie

Clinton County

Bennett, George W.	Elsie
Cook, Bruno	Westphalia
Elliott, Bruce R.	Ovid
Foo, Charles T.	St. Johns

Frace, Guy H.	St. Johns
Hart, Dean W.	M
Henthorn, A. C.	St. Johns
Ho, Thomas Y.	St. Johns

Delta County

Backus, Arthur	Powers
Benson, G. W.	Escanaba
Boyce, D. H.	Escanaba
Brenner, Ervine J.	M
Carlton, A. J.	Escanaba
Chenoweth, Nancy R.	Escanaba
Clausen, Claire H.	M
Defnet, Harry John	Escanaba

Diamond, J. A.	Gladstone
Frenn, N. J.	Bark River
Fylie, James	M
Groos, Quinten Harold	Escanaba
Gross, Louis P.	Escanaba
Hult, Otto S.	Gladstone
Kitchen, A. S.	Escanaba
Lemire, Wm. A.	M

ROSTER MSMS

Dickinson-Iron Counties

Addison, E. R.	Crystal Falls
Alexander, W. H.	Iron Mountain
Anderson, E. B.	Iron Mountain
Boyce, George H.	Iron Mountain
Browning, James L.	M
Fiedling, William	Norway
Fredrickson, Geron	Iron Mountain

McEachran, Hugh D.	M
Menzies, Clifford	Iron Mountain
Retallack, R. C.	M
Smith, Donald R.	Iron Mountain
White, Robert E.	Stambaugh
Witkow, Alexander	Iron Mountain

Eaton County

Arner, Fred L.	Bellevue
Brown, B. Philip	M
Burdick, Austin F.	Grand Ledge
Carothers, Daniel J.	M
Clements, F. W.	Eaton Rapids
Engle, Paul	Olivet
Goff, S. B.	M
Hannah, H. W.	Charlotte
Hargrave, Don V.	Eaton Rapids

Quick, Phil H.	Olivet
Sackett, C. S.	Charlotte (Ret.)
Sassaman, F. W.	Charlotte
Sevener, C. J.	M
Sevener, Lester G.	Charlotte
Myers, Albert W.	Potterville
Paine, E. Madison	Traverse City
Paine, E. M.	Grand Ledge

Genesee County

Adams, Chester	M
Andrews, N. A. C.	M
Anthony, George E.	M
Bahlman, Gordon H.	Flint
Baird, James	Flint
Bald, Frederick W.	M
Barbour, Fleming A.	Flint
Baske, Franklin W.	Flint
Bateman, L. G.	M
Benson, J. C.	Flint
Bernstein, Eli N.	M
Biggar, H. R.	Flint
Bishop, D. L.	Flint
Blakeley, A. C.	Flint
Bogart, Leon M.	Flint
Boles, Wm. P.	Flint
Bonathan, A. T.	Flint
Bradley, Robert	M
Branch, Hira E.	M
Brasie, Donald E.	Flint
Briggs, Guy D.	Flint
Bruce, Wm. W.	M
Buchanan, W. Fremont	Fenton
Burkett, L. V.	Flint
Burnell, Max	Flint
Burnside, Howard B.	M
Chambers, Myrton S.	Flint
Chandler, M. E.	Flint
Charters, John H.	Fenton
Childs, Lloyd H.	Flint
Clark, Clifford P.	Flint
Colwell, C. W.	M
Connell, J. T.	Flint
Conover, G. V.	M
Conover, T. S.	Flint
Cook, Henry	Flint
Covert, F. L.	Gaines
Crane, Harley C.	Flint
Credille, B. A.	Flint
Curry, George	Flint
Curtin, J. H.	Flint
David T. George	Flint
Del Zingro, N.	Davison
Dimond, E. G.	Flint
Dodds, F. E.	Flint
Drewyer, Glen	M
Edgerton, A. C.	Clio
Eichhorn, Ernest	Flint
Eickhorst, Thomas N.	M
Elliott, H. B.	New York City
Evers, J. W.	Flint
Farhat, M. M.	M
Finkelstein, T.	M
Flynn, S. T.	M
Foley, S. I.	Flint
Fuller, H. T.	M
Gelenger, S. M.	M
Gleason, N. Arthur	Flint
Goering, George R.	Flint
Golden, M. M.	Flint
Goodfellow, B. T.	Flint

Gorne, S. S.	M
Graham, Hugh W.	Mt. Morris
Gray, Edwin F.	M
Grover, H. F.	Flint
Gutow, I.	Flint
Gutow, J. J.	M
Guile, Earle	Flint
Guile, G. S.	Flint
Gundry, G. L.	Grand Blanc
Hague, R. F.	M
Halligan, R. S.	Flint
Hamady, Ruth B.	Flint
Handy, John W.	Flint
Harper, A. W.	Flint
Harper, Homer	Flint
Harrison Leo D.	Flint
Hawkins, James E.	Flint
Hays, George A.	M
Hiscock, H. H.	M
Houston, James	M
Hubbard, Wm. B.	Swartz Creek
Huffman, Wilfred L.	Flint
Jefferson, Harry	Flint
Johnson, Arthur H.	Flint
Johnson, Frank D.	M
Jones, Lafon	Flint
Kaleta, Edward	M
Kaufman, Lewis D.	M
Kirk, A. Dale	Flint
Knapp, M. S.	Fenton (Ret.)
Kretchmar, A. H.	Flint
Kurtz, J. J.	Flint
Lambert, L. A.	M
Lavin, Kathryn R.	Flint
Leach, J. L.	Flint
Livesay, Jackson E.	Flint
Logan, G. W.	Flushing
MacDuff, R. B.	Flint
MacGregor, D. M.	Flint
MacGregor, James C.	Flint
MacGregor, R. W.	Flint
Macksood, Joseph	Flint
Marsh, H. L.	Flint
Marshall, William H.	Flint
Mason, Elta	Flint
Matthewson, Guy C.	Flint
McArthur, A.	Flint
McArthur, R. H.	M
McGarry, Burton G.	Fenton
McGarry, R. A.	Flint
McKenna, O. W.	Flint
Miller, Edwin E.	Flint
Miller, Loren Eugene	M
Miltick, Anthony J.	Flint
Miner, Frederick B.	Flint
Moore, James W.	Flint
Moore, Kenneth B.	Flint
Morrish, Ray S.	Flint
Morrissey, V. H.	Flint
Mosier, Edward C.	Otisville
Odle, Ira	Flint
Olson, James A.	Flint

Gogebic County

Lieberthal, M. J.	Ironwood
Lieberthal, Paul	Ironwood
Maccani, Wm. L.	Ironwood
Maloney, F. G. H.	Ironwood
Nezworski, H. T.	Ramsey
O'Brien, A. J.	Ironwood
Pierpont, D. C.	Ironwood

Pinkerton, H. A.	M
Reynolds, F. L. S.	Ironwood
Stevens, Charles E.	Ironwood
Tew, Wm. Ellwood	Bessemer
Tressel, H. A.	Wakefield
Urquhart, C. C.	Ironwood
Wacek, W. H.	Ironwood

Anderson, Charles E.	Bessemer
Eisele, D. C.	Ironwood
Gertz, M. A.	Ironwood
Gorrilla, A. C.	Ironwood
Gullison, Miles	M
Hendrickson, A. O.	Ironwood
Holm, Henry	Ironwood

ROSTER MSMS

Grand Traverse-Leelanau-Benzie Counties

Baumann, Milton C.	M	Suttons Bay
Bolan, Ellis J.	S	Kingsley
Brownson, Jay J.	M	
Brownson, Kneale M.	M	
Bushong, B. B.	M	Traverse City
Covey, E. L.	Honor	
Ellis, Claude I.	S	Suttons Bay
Gauntlett, J. W.	M	Traverse City
Goodrich, Dwight	M	Traverse City
Graw, F. A.	M	Traverse City
Hamilton, Earl E.	M	
Huston, Russell R.	E	Elk Rapids
Hyslop, Wm. T.	M	Traverse City
Jerome, Jerome T.	M	Traverse City
Kitson, V. H.	E	Elk Rapids
Knapp, Joseph L.	M	
Kyselka, H. B.	M	Traverse City
Lemen, Charles E.	M	
Lentz, R. J.	M	
Lossman, R. T.	M	Traverse City
Murphy, Fred E.	Cedar	
Nickels, M. M.	M	Traverse City
Osterlin, Mark	M	Traverse City
Rinear, Edwin	M	Traverse City
Sheets, R. Philip	M	Traverse City
Sladek, E. F.	M	Traverse City
Stone, Fordyce H.	M	Beulah
Swanton, L.	M	Traverse City
Swartz, F. G.	M	Traverse City
Thacker, Fred R.	M	Frankfort
Thirlby, E. L.	M	Traverse City
Thompson, T. W.	M	Traverse City
Trautman, Frederick B.	M	
Van Leuven, B. H.	M	Frankfort
Way, Lewis R.	M	
Weitz, Harry	M	Traverse City
Wilcox, Paul H.	M	Traverse City
Willard, Wm. G.	M	Benzonia
Willoughby, Frances Lois	M	Traverse City
Zielke, I. H.	M	
Zimmerman, J. G.	M	

Gratiot-Isabella-Clare Counties

Aldrich, Alfred L.	Ithaca
Barstow, D. K.	M
Barstow, Wm. E.	S
Baskerville, C. M.	Mt. Pleasant
Becker, Myron G.	Edmore
Budge, M. J.	Ithaca
Burch, L. J.	Mt. Pleasant
Burt, C. E.	Ithaca
Carney, T. J.	Alma
Dale, Edward C.	M
Davis, L. L.	M
Drake, Wilkie M.	Breckenridge
DuBois, C. F.	Alma
Graham, B. J.	M
Hall, B. C.	Pompeii
Hammerberg, Kuno	M
Harrigan, Wm. L.	Mt. Pleasant
Hersee, Wm. E.	M
Hobbs, A. D.	St. Louis
Howe, Leslie A.	Breckenridge
Hyslop, Leland F.	Mt. Pleasant
Kilborn, H. F.	Ithaca
Lamb, E. T.	Alma
McArthur, Stewart C.	Clare
Miller, S. W.	M
Oldham, E. S.	M

Putzig, Louis W.	Blanchard
Rondot, E. F.	Lake
Rottshafer, J. L.	M
Sanford, B. J.	Clare
Sharon, J. P.	Mt. Pleasant
Silvert, P. P.	Vestaburg
Slattery, F. G.	M
Strange, Russell H.	Mt. Pleasant
Waggoner, R. L.	St. Louis
Wilcox, R. A.	Alma
Wilson, Earl C.	Harrison
Wolfe, Kenneth P.	M
Wood, Cornelius B.	M

Hillsdale County

Allegar, W. E.	Pittsford
Bower, Charles T.	Hillsdale
Clobridge, C. E.	Allen
Davis, L. A.	Montgomery
Day, Luther W.	Jonesville
Douglas, E. W.	Hillsdale
Fisk, Fred B.	Jonesville
Green, B. F.	Hillsdale
Hamilton, A. J.	Hillsdale
Hanke, George R.	Ransom
Hodge, C. L.	Reading
Hughes, Henry F.	Hillsdale
Johnson, C. E.	M
Kinzel, R. W.	M
MacNeal, John A.	Hillsdale
Martindale, E. A.	Hillsdale

Mattson, H. F.	M
Miller, Harry C.	Hillsdale
Moench, G. F.	Hillsdale
Poppen, C. J.	Reading
Sandor, A. A.	M
Sawyer, Walter W.	M
Sterling, John S.	Jerome
Strom, A. W.	M

Houghton-Baraga-Keweenaw Counties

Abrams, James C.	Calumet
Acocks, J. R.	M
Aldrich, A. B.	Houghton
Aldrich, Addison D.	Houghton
Aldrich, Leonard	M
Bourland, Philip D.	Calumet
Brewington, George F.	Mohawk
Coffin, Leslie E.	Painesdale
Cooper, C. A.	Hancock
Gregg, W. T. S.	Calumet
Hillmer, R. E.	Beacon Hill
Janis, A. J.	Hancock
Kadin, Maurice	M
King, Wm. T.	Ahmeeek
Kirton, Joseph R. W.	Calumet
Kolb, F. E.	M
LaBine, Alfred	Houghton
Levin, Simon	Houghton
MacQueen, Donald K.	Laurium
Manthei, W. A.	Lake Linden
Marshall, Frank F.	L'Anse
McClure, Robert James	Calumet
Pleune, R. E.	M
Quick, James B.	Laurium

Roche, A. C.	Calumet
Roche, Andrew M.	M
Sarvela, H. L.	Hancock
Scott, Wm. P.	Houghton
Sloan, P. S.	Houghton
Smith, Charles R.	Hancock
Stahr, H. S.	Houghton
Stern, Isadore D.	Houghton
Stewart, J. C. B.	Painesdale
Tinetti, Ernest F.	M
Ware, H. M.	Nahma
Wickliffe, T. P.	Calumet
Winkler, Henry J.	L'Anse

Gettel, Roy R.	Kinde
Henderson, J. Bates	Sebewaing
Herrington, Charles I.	Bad Axe
Herrington, Willet J.	Bad Axe

Ritsema, John	Sebewaing
Scheurer, C.	Pigeon
Thummie, Harrison F.	Sebewaing

Albert, Wilford D.	Leslie
Atkinson, Everett H.	E Lansing
Barrett, C. D.	Mason
Bartholomew, Henry S.	
Bauer, Theodore I.	Lansing
Behn, Wm. C.	Lansing
Bellinger, E. G.	Lansing
Black, Charles E.	Williamston
Black, Gertrude	Williamston
Bradford, C. W.	Lansing
Breakey, Robert S.	Lansing
Brown, F. W.	M
Brubaker, Earl	Lansing
Brucker, Karl B.	Lansing
Bruegel, O. H.	E Lansing
Burhans, Robert A.	M
Cameron, W. J.	Lansing
Carr, E. I.	Lansing
Christian, L. G.	Lansing
Clark, William E.	M
Clinton, George	M

Cook, R. J.	Lansing
Cope, H. E.	Lansing
Corneliuson, Goldie B.	Lansing
Corsaut, J. C.	Mason
Cross, Frank S.	Chicago, Ill.
Darling, L. H.	Lansing
Dart, Dorothy	Mason
Davenport, C. S.	Lansing
Dean, Carleton	Lansing
Delay, C. P.	Webberville
DeVries, C. F.	Lansing
Doyle, Charles R.	M
Doyle, C. P.	Lansing
Drolett, Donald J.	M
Drolett, Fred J.	Lansing
Drolett, Lawrence	M
Dunn, F. C.	Lansing
Dunn, F. M.	Lansing
Ellis, Bertha W.	Lansing
Ellis, C. W.	Lansing
Feehey, Kenneth J.	Lansing
Finch, Russell L.	Lansing
Fisher, D. W.	M

Folkers, Leonard M.	E. Lansing
Fosget, Wilbur W.	Lansing
Foust, E. H.	Lansing
French, Horace L.	Lansing
Galbraith, Dugald A.	Lansing
Gardner, C. B.	Lansing
Gibson, T. E.	M
Goldner, R. E.	M
Gunderson, G. O.	Lansing
Heald, Gordon H.	M
Harris, Dean W.	Lansing
Harris, Herbert W.	M
Harrold, J. F.	M
Hart, L. C.	Lansing
Haynes, H. B.	Lansing
Haze, Harry A.	Lansing
Heckert, Frank B.	Lansing
Heckert, J. K.	Lansing
Hendren, Owen	M
Hermes, Ed. J.	Lansing
Himmelberger, R. J.	M
Hodges, Kenneth P.	M

ROSTER MSMS

Holland, Charles P.	E. Lansing
Huggett, Clare C.	Lansing
Hughes, Howard Allen	Lansing
Huntley, Fred M.	Lansing
Hurth, M. S.	Lansing
Johnson, K. H.	M
Jones, Francis A.	Lansing
Jones, Francis, Jr.	Lansing
Kalmbach, R. E.	Lansing
Keim, C. D.	Lansing
Kelly, William H.	M
Kent, Edith Hall	Lansing
Kent, Herbert K.	Lansing
Kraft, L. C.	Leslie
Lang, R. R.	M
Larrabee, E. E.	Williamston
LeDuc, Don M.	M
Ley, Wilfred	M
Loree, Maurice C.	Lansing
Lucas, T. A.	Lansing
Ludlum, L. C.	Lansing
Markuson, Kenneth E.	Lansing
Martin, Wayne O.	Lansing
McConnell, E. G.	Lansing (Ret.)
McCorvie, C. Ray	E. Lansing
McCoy, Earl M.	Grand Lodge
McCrumb, R. R.	Lansing
McElmurry, Leland R.	Lansing
McElmurry, N. K.	Perry
McGillicuddy, Oliver B.	M
McGillicuddy, R. J.	M

McIntyre, J. Earl	Lansing
McNamara, William E.	Lansing
McPherson, E. G.	Champion
Meade, Wm. H.	M
Mercer, Walter E.	M
Meyer, Hugh R.	Lansing
Miller, H. A.	Lansing
Morrison, C. V.	Lansing
Morrow, R. J.	M
Niles, B. D.	Lansing
O'Sullivan, Gertrude	Mason
Phillips, H. H.	Lansing
Pinkham, R. A.	Lansing
Ponton, J.	Mason
Potter, Earl C.	M
Prall, H. J.	Lansing
Randall, O. M.	Lansing
Rector, Frank L.	Lansing
Richards, F. D.	M
Roberts, D. W.	Okemos
Roberts, Russell	Lansing
Robson, Edmund J.	M
Rozan, J. S.	Lansing
Rozan, M. M.	M
Russell, Claude F.	Lansing (Ret.)
Sander, John F.	M
Sanford, Thomas M.	Lansing
Seger, Fred L.	Lansing
Shaw, Milton	Lansing
Shepherd, C. S.	Lansing
Sherman, George A.	East Lansing

Sichler, Harper C.	Lansing
Silverman, Irving E.	M
Smith, Anthony V.	Mason
Smith, H. M.	Lansing
Smith, Lillian R.	Lansing
Snell, D. M.	Lansing
Snyder, LeMoine	Lansing
Spencer, Perry	M
Steiner, A. A.	M
Stiles, Frank	M
Strauss, P. C.	Lansing
Stringer, C. J.	Lansing
Swartz, Frederick C.	M
Tallman, Frank F.	Lansing
Tamblyn, F. W.	M
Thiehoff, E. V.	Lansing
Toothaker, Kenneth	M
Town, Floyd R.	Lansing
Towne, Lawrence C.	Lansing
Trost, F. L.	Holt
Vander Slice, E. R.	Lansing
Vander Zalm, T. P.	M
Wadley, R.	Lansing
Warford, T. J.	Lansing
Webb, Roy O.	M
Weinburgh, H. B.	Lansing
Welch, William H.	Lansing
Wellman, John M.	M
Wetzel, John O.	Lansing
Wiley, Harold W.	Lansing
Willson, Howard S.	Lansing
Wilson, Harry A.	Lansing

Ionia-Montcalm Counties

M. Benison, A. L.	M
Bird, Wm. L.	Greenville
Bower, A. J.	Greenville
Bracey, L. E.	Sheridan
Bunce, E. P.	Trufant
Dunkin, Lloyd S.	M
Ferguson, F. H.	Carson City
Fleming, J. C.	Pewamo
Fox, Harold M.	Portland
Geib, O. P.	Carson City
Hansen, M. M.	Greenville
Haskell, Robert J.	Northville

Jackson County

Adams, Dewitt C.	Jackson
Ahronheim, J. H.	M
Alter, R. H.	Jackson
Anderson, W. B.	Jackson
Appel, S.	M
Baker, G. M.	Parma
Balconi, Henry	Jackson
Bartholic, F. W.	M
Beckwith, S. A.	Stockbridge
Brown, H. A.	Jackson
Bullen, G. R.	Jackson
Chabut, H. M.	Jackson
Chivers, E. Q.	Jackson
Clarke, C. S.	Jackson
Cochrane, Wayne A.	Jackson
Cooley, Randall M.	Jackson
Corley, C.	Jackson
Corley, Ennis	Jackson
Cox, Ferdinand	Jackson
Crowley, Edward D.	M
Culver, Guy D.	Stockbridge
DeMay, C. E.	Jackson
Dengler, C. R.	Jackson
Edmunds, J. M.	M
Enders, W. H.	Jackson
Finton, Walter L.	Jackson
Finton, W. R.	M
Foust, W. L.	Grass Lake
Gibson, F. J.	Jackson
Glover, H. G.	Jackson
Gordon, D. L.	M
Greenbaum, Harry	M
Hackett, T. E.	Jackson
Hanft, Cyril F.	Springport

Pray, Frank F.	Jackson
Pray, George R.	Jackson
Ransom, F. G.	Jackson
Riley, Philip A.	Jackson
Roberts, Arthur J.	Jackson
Rutz, Lawrence M.	Jackson
Schepeler, Cortland W.	Brooklyn
Scheurer, Peter A.	Manchester
Schmidt, T. E.	Jackson
Scott, John A.	M
Seybold, Edward G.	M
Schaefier, A. M.	Jackson
Sirhal, Alfred M.	M
Smith, Dean W.	Jackson
Speck, John W.	Jackson
Southwick, W. A.	M
Stewart, L. L.	Jackson
Sugar, Samuel	M
Susskind, M. V.	M
Tate, Cecil E.	M
Thayer, E. A.	Jackson
Thalner, L. F.	Jackson
Townsend, J. W.	Vandercook Lake
Tuthill, F. S.	Concord
VanSchoick, J. D.	Hanover
VanSchoick, Frank	Jackson
Vivirski, Edward E.	M
Wertenberger, M. D.	Jackson
Wholihan, John W.	Michigan Center
Wickham, W. A.	M
Wilson, E. G.	Jackson
Wilson, N. D.	Jackson
Winter, G. E.	Jackson
Woodward, George D.	Jackson

Kalamazoo County

Borgman, Wallace	M
Boys, C. E.	Kalamazoo
Brooks, Ervin D.	Kalamazoo
Brown, I. W.	Kalamazoo
Burns, J. T.	Kalamazoo
Caldwell, Geo. H.	Kalamazoo
Cobb, Horace R.	Kalamazoo
Cook, R. G.	Kalamazoo
Crane, W. G.	M
Crawford, Kenneth	M
Dahlstrom, Doris	Kalamazoo
DenBleyker, Walter	Kalamazoo
DeWitt, L. H.	Kalamazoo

Dowd, B. J.	M
Doyle, F. M.	M
Ertell, Wm. Francis	Kalamazoo
Fast, R. B.	Kalamazoo
Fopeano, John V.	M
Fulkerson, C. B.	Kalamazoo
Fuller, R. T.	M
Gerstner, Louis	Kalamazoo
Gilding, Joseph	M
Glenn, Audrey	Ft. Wayne, Ind.
Grant, Frederick E.	Kalamazoo
Gregg, Sherman	Kalamazoo
Harter, Rudolph S.	Schoolcraft

ROSTER MSMS

Heersma, H. S.	Kalamazoo	MacGregor, J. R.	M
Hildreth, R. C.	Kalamazoo	Malone, James G.	M
Hobbs, Edw. J.	Galesburg	Marshall, Don	M
Hodgman, Albert B.	M	McCarthy, J. S.	Kalamazoo
Hoebke, William G.	Kalamazoo	McIntyre, Charles H.	M
Holder, Charles	M	Moe, Carl Rex	M
Howard, W. H.	Galesburg	Morter, Roy A.	Kalamazoo
Hubbell, R. J.	Kalamazoo	Nell, Edward R.	M
Huyser, William C.	Kalamazoo	Nibbelink, Benjamin	Kalamazoo
Ilgenfritz, F. M.	Kalamazoo	Nystrom, Ruth	Kalamazoo
Irwin, William D.	M	Okun, M. H.	M
Jackson, Howard C.	M	Osborne, Charles E.	M
Jackson, John B.	Kalamazoo	Patmos, Martin	M
Jennings, W. O.	Kalamazoo	Peelen, J. W.	M
Kavanaugh, Wm. R.	M	Peele, Matthew	M
Kenzie, W. N.	Battle Creek	Perry, Clifton	Kalamazoo
Klerk, W. J.	M	Prentice, Hazel R.	Kalamazoo
Koestner, Paul	M	Pullon, A. E.	Kalamazoo
Kuhs, Milton L.	Kalamazoo	Righterink, G. H.	M
Lambert, R. H.	Kalamazoo	Righterink, H. A.	Kalamazoo
Lang, W. W.	Kalamazoo	Rockwell, Donald C.	Kalamazoo
Lavender, Howard	Kalamazoo	Ryan, F. C.	M
Light, Richard U.	Kalamazoo	Sage, E. D.	Vicksburg
Light, S. Rudolph	Kalamazoo	Scholten, D. J.	Kalamazoo
Littig, John	Kalamazoo	Scholten, Wm.	Kalamazoo
Schrier, C. M.		Schrier, Paul	M
Schrier, Thomas		Scott, Wm. A.	M
Shackleton, Wm. E.	Kalamazoo	Shepard, Benjamin A.	Oshtemo
Shook, R. W.		Simpson, B. W.	Kalamazoo
Snyder, Roscoe F.		Sofen, Morris B.	Kalamazoo
Southworth, M. N.		Stryker, Homer H.	Kalamazoo
Upjohn, E. Gifford		Upjohn, L. N.	Kalamazoo
Van Urk, Thomas		Verhage, Martin D.	M
Volderauer, John C.		Wagar, Carl	M
Wagenaar, E. H.		Walker, Burt D.	Kalamazoo
Walker, Burt D.		Westcott, L. E.	Kalamazoo
Wilbur, E. P.		Wilbur, E. P.	Kalamazoo
Youngs, A. S.		Youngs, C. A.	Kalamazoo
Youngs, C. A.			Kalamazoo

Kent County

Adams, F. A.	M	Elliott, James A.	Grand Rapids
Aitken, George T.	M	Failing, John F.	M
Alexander, Marshall O.	Grand Rapids	Farber, Charles E.	M
Alfenito, Felix S.	M	Faust, L. W.	Grand Rapids
Allen, R. V.	Grand Rapids	Fee, Manson G.	M
Bachman, G. A.	Grand Rapids	Fellows, Kenneth E.	M
Baert, Geo. H.	Grand Rapids	Ferguson, James	M
Baker, Abel J.	Grand Rapids	Ferguson, Lynn A.	Grand Rapids
Ballard, M. S.	Grand Rapids	Ferguson, Ward S.	Grand Rapids
Balyeat, Gordon W.	M	Ferrand, L.	M
Barber, Clarence H.	Grand Rapids	Fitts, Ralph L.	M
Batts, Martin	M	Flynn, J. D.	M
Beaton, James H.	M	Foshee, J. C.	Grand Rapids
Beeman, Carl B.	M	Frantz, Chas. H.	M
Beeman, C. E.	Grand Rapids	Freyleyng, Robert H.	M
Beets, W. Clarence	M	Fuller, E. H.	Grand Rapids
Bell, Charles M.	M	Gaikema, E. W.	Grand Rapids
Bettison, Wm. L.	M	Geenan, C. J.	Grand Rapids
Billings, Elton P.	Grand Rapids	Gibbs, F. F.	Grand Rapids
Blackburn, Henry M.	Grand Rapids	Gilbert, R. H.	Grand Rapids
Bloxsom, Paul W.	Grand Rapids	Gillett, O. H.	Grand Rapids
Boelkins, Richard C.	M	Grant, Lee O.	Grand Rapids
Boet, F. A.	Grand Rapids	Graybiel, George P.	Caledonia
Boet, John	M	Griffith, L. S.	M
Bond, Geo. Lewis	Grand Rapids	Hagerman, D. B.	Grand Rapids
Bosch, L. C.	Grand Rapids	Hammond, T. W. (Ret.)	Grand Rapids
Brace, Fred	M	Hardy, Faith F.	Grand Rapids
Brayman, C. W.	Cedar Springs	Hayes, L. W.	Howard City
Brink, Russell	M	Heetderks, Dewey	Grand Rapids
Brook, Jacob D.	Grandville	Henry, James, Jr.	Grand Rapids
Brotherhood, J. S.	Grand Rapids	Herrick, Ruth	Grand Rapids
Browning, Eugene S.	Grand Rapids	Hill, A. Morgan	M
Buesing, O. R.	M	Hilt, Lawrence M.	M
Buist, S. J.	Grand Rapids	Hodgen, J. T.	Grand Rapids
Bull, Frank L.	Sparta	Hoeck, William	M
Burleson, John S.	Grand Rapids	Holcomb, J. W.	Grand Rapids
Burling, Wesley M.	Grand Rapids	Holdsworth, M. J.	M
Butler, Wm. J.	Grand Rapids	Holkeboer, Henry D.	Grand Rapids
Byers, Earl J.	Grand Rapids	Hollander, Stephen	M
Byrd, Mary Lou	Grand Rapids	Hoogerhyde, Jack	M
Campbell, Alexander M.	Grand Rapids	Houghton, G. D.	Caledonia
Carpenter, Luther C.	M	Huffman, A. R.	Grand Rapids
Chadwick, W. L.	M	Hunderman, Edward	Grand Rapids
Chamberlain, L. H.	Grand Rapids	Hutchinson, Robert J.	Grand Rapids
Chandler, Donald	Grand Rapids	Hyland, Wm. A.	Grand Rapids
Claytor, R. W.	Grand Rapids	Ingersoll, C. F.	M
Collisi, Harrison S.	M	Irwin, Thomas C.	Grand Rapids
Colvin, W. G.	M	Jameson, Fred M.	M
Cosgrove, Wm. J.	M	Jaracz, W. J.	Grand Rapids
Crane, Charles V.	Grand Rapids	Jarvis, Charles	Grand Rapids
Crane, Harold D.	M	Kelly, Robert E.	M
Cuncannan, M. E.	Grand Rapids	Kemmer, Thomas R.	Grand Rapids
Currier, F. P.	Grand Rapids	Kendall, Eugene L.	Grand Rapids
Dales, Ernest W.	Grand Rapids	Klaus, C. D.	M
Damstra, H. J.	M	Kniskern, P. W.	M
Davis, D. B.	M	Kooistra, Henry P.	Grand Rapids
Dean, Alfred W.	Grand Rapids	Kremer, John	Grand Rapids
De Boer, Guy Wm.	M	Kreulen, H. J.	Grand Rapids
Dell, E. E.	Sand Lake	Krikard, P. J.	Grand Rapids
DeMaagd, Gerald	Rockford	Krupp, C. G.	Grand Rapids
DeMol, Richard J.	Grand Rapids	Lamb, George F.	Grand Rapids
Denham, R. H.	Grand Rapids	Lanning, N. E.	Grand Rapids
DePree, Isla G.	Grand Rapids	Lanting, D. B.	Grand Rapids
DePree, Joseph	Grand Rapids	Lavan, John	M
DeVel, Leon	M	Lawrence, Howard C.	Grand Rapids
DeVries, Daniel	Grand Rapids	Lentini, Joseph R.	M
Dewar, M. M.	Grand Rapids	Le Roy, Simeon	Grand Rapids
Dick, Mark W.	M	Lieffers, Harry	Grand Rapids
Dixon, Willis L.	Grand Rapids	Logie, James W.	Grand Rapids
Doran, Frank L.	Grand Rapids	Lyman, William D.	Grand Rapids
Drost, James C.	Grand Rapids	McCandless, Robert	Grand Rapids
DuBois, Wm. J.	Grand Rapids	MacDonald, Allan	M
Duiker, Henry	Grand Rapids	MacDonell, James A.	Lowell
Eaton, Robert M.	Grand Rapids	Marrin, M. M.	M
Egglesston, H. R.	Grand Rapids	Marsh, John P.	Grand Rapids

Schrier, C. M.		Schrier, C. M.	M
Schrier, Paul		Schrier, Paul	M
Schrier, Thomas		Schrier, Thomas	M
Scott, Wm. A.		Scott, Wm. A.	M
Shackleton, Wm. E.	Kalamazoo	Shackleton, Wm. E.	Kalamazoo
Shepard, Benjamin A.	Oshtemo	Shepard, Benjamin A.	Oshtemo
Shook, R. W.		Shook, R. W.	M
Simpson, B. W.	Kalamazoo	Simpson, B. W.	Kalamazoo
Snyder, Roscoe F.	Kalamazoo	Snyder, Roscoe F.	Kalamazoo
Sofen, Morris B.		Sofen, Morris B.	M
Southworth, M. N.		Southworth, M. N.	M
Stryker, Homer H.	Kalamazoo	Stryker, Homer H.	Kalamazoo
Upjohn, E. Gifford	Kalamazoo	Upjohn, E. Gifford	Kalamazoo
Upjohn, L. N.	Kalamazoo	Upjohn, L. N.	Kalamazoo
Van Urk, Thomas		Van Urk, Thomas	M
Verhage, Martin D.		Verhage, Martin D.	M
Volderauer, John C.		Volderauer, John C.	M
Wagar, Carl		Wagar, Carl	M
Wagenaar, E. H.		Wagenaar, E. H.	M
Walker, Burt D.	Kalamazoo	Walker, Burt D.	Kalamazoo
Westcott, L. E.	Kalamazoo	Westcott, L. E.	Kalamazoo
Wilbur, E. P.	Kalamazoo	Wilbur, E. P.	Kalamazoo
Youngs, A. S.	Kalamazoo	Youngs, A. S.	Kalamazoo
Youngs, C. A.	Kalamazoo	Youngs, C. A.	Kalamazoo

ROSTER MSMS

Van Belois, Harvard J....Grand Rapids
 Van Bree, R. S....Grand Rapids
 Vanden Berg, Henry J....Grand Rapids
 Vander Meer, Ray.....M
 VanDuine, H. J....Byron Center
 Vann, N. S....Grand Rapids
 Van Noord, Gelmer A....Grand Rapids
 Van Solkema, Andrew....Grand Rapids
 Van Solkema, Arthur.....M
 Van Woerkom, Daniel....Grand Rapids
 Van Zwaluwenberg, Benjamin....
 Grand Rapids

Veldman, Harold E....Grand Rapids
 Veenboer, Wm. H....Grand Rapids
 Venema, J. R....Grand Rapids
 Vis, Wm. R....Grand Rapids
 Vyn, J. D....Grand Rapids
 Warnshuis, Frederick C....
 Windsor, Ontario
 Webb, Rowland....Grand Rapids
 Webber, Jerome E.....M
 Wedgewood, L. G....Grandville
 Wells, Merrill....Grand Rapids
 Wenger, Aaron V....Grand Rapids

Wenger, John N.....Coopersville
 Whalen, JohnM
 Whinery, Joseph B....Grand Rapids
 Wiggers, J. R.....Grand Rapids
 Willits, P. W.....Grand Rapids
 Wilson, Wm. E....Grand Rapids (Ret.)
 Winfield, Emery D....Grand Rapids
 Winter, Garrett E....Grand Rapids
 Woodburne, A. R.....M
 Wright, John M....Grand Rapids
 Wright, Thomas B....Grand Rapids
 Yegge, J. P....Kent City

Best, Herbert M....Lapeer
 Bishop, G. C....Almont
 Burley, David H....Almont
 Chapin, Clarence D....Columbiaville
 Dorland, Clarke

Jackson, Carl C.....M
 McBride, J. R.....M
 McLeod, K. W. A....Lapeer
 Merz, Henry G....Lapeer
 O'Brien, Daniel J....Lapeer

Smith, G. L.....Imlay City
 Thomas, J. Orville....North Branch
 Tinker, F. A....Lapeer
 Zemmer, H. B....Lapeer

Abraham, A. O....Hudson
 Blanchard, L. E....Hudson
 Bland, J. P....Adrian
 Blanden, Merwin R....Tecumseh
 Campbell, C. A.....M
 Clafin, G. M....Adrian
 Clark, A. D....Adrian
 Claxton, W. T.....M
 Colbath, W. E....Adrian
 Growth, Bowers H....Addison
 Hall, George C.....M
 Hambly, S. B....Tipton
 Hammel, H. H.....M

Hardy, P. B....Tecumseh
 Heffron, Howard H....Adrian
 Helzerman, Ralph F.....M
 Hewes, A. B....Adrian
 Hornsby, W. B....Clinton
 Howland, F. A....Adrian
 Iler, Harris D.....M
 Jewett, Wm. E., Jr....Adrian
 Lamley, Arthur E....Blissfield
 Loveland, Horace H....Tecumseh
 MacKenzie, W. S....Adrian
 McCue, Francis J., Jr.....M
 Marsh, R. G. B.....M

Miller, Perry Lynford.....M
 Morden, Esli T....Adrian
 Pasternacki, Arthur S.....M
 Patmos, Bernard

Peters, W. L.....Morenci

Raabe, E. C.....Morenci

Rawson, A. P.....M

Rogers, J. D.....M

Spalding, I. L....Hudson

Stafford, Leo J....Adrian

Tubbs, R. V....Blissfield

Van Dusen, C. A....Blissfield

Wood, A. C....Adrian

Wynn, G. H.....M

Brigham, JeanetteHowell
 Cameron, Duncan A.....M
 Coughlin, Florence J....Howell
 Crandell, Claire

Gamble, Shelby G.....M
 Glenn, Bernard H....Fowlerville
 Hayner, R. A.....M
 Hendren, J. J....Fowlerville
 Hill, Harold C.....M
 Huntington, H. G....Howell

Laboe, Edward W....Howell
 Leslie, G. L.....M
 McGregor, Archie J....Brighton
 McDowell, Guy Marshall....Howell
 Sigler, Hollis L....Howell
 Stephens, D. C.....M

Bohn, Frank P....Newberry
 Campbell, Earl H....Newberry
 Franklin, SidneyNewberry
 Gibson, Robert E....Newberry

Lance, Paul E.....M
 Perry, Henry E....Newberry
 Purmort, Wm. R., Jr....Newberry
 Rehn, Adolph T....Newberry

Spinks, Robert Earl....Newberry
 Surrell, Mathew A.....M
 Swanson, George F.....M
 Toms, Chas. B....Newberry

Abbis, Frederick J....Romeo
 Banting, O. F....Richmond
 Berry, Henry G....Mt. Clemens
 Bower, A. B....Armada
 Brady, Milo J....St. Clair Shores
 Caster, E. Wilbur....Mt. Clemens
 Crawford, A. M....Romeo
 Croman, Joseph M., Jr....Mt. Clemens
 Dudzinski, Edmund J.....M
 Fluemer, OswaldMt. Clemens

Hawley, R. E....St. Clair Shores
 Kane, Wm. J....Mt. Clemens
 La Reviere, J. O....Mt. Clemens
 Moore, G. F....Mt. Clemens
 Reichman, Joseph J.....M
 Rivard, Charles L.....M
 Roth, G. E.....M
 Ruedisueli, C. A....East Detroit
 Salot, R. F.....M
 Siegfried, E. G....New Haven

Stone, ElizabethRomeo
 Thompson, A. A....Mt. Clemens
 Ullrich, R. W.....Mt. Clemens
 Wellard, Henry C....M
 Whitley, Alec....St. Clair Shores
 Wilde, M. M....Warren
 Wiley, D. Bruce.....Utica
 Wiley, Herbert H....Utica
 Wolfson, Victor H....Mt. Clemens

Bryan, Kathryn M....Manistee
 Grant, C. L....Manistee
 Hansen, E. C.....M
 Konopa, John F.....M

Lewis, Lee A....Manistee
 MacMullen, HarlenManistee
 Miller, E. B....Manistee
 Norconk, Ward H....Bear Lake

Oakes, Ellery A....Manistee
 Ogilvie, G. D.....Copemish
 Quinn, Henry M....Manistee
 Ramsdell, Homer A....Flint
 Switzer, Lars W....

Bennett, Arthur K....Marquette
 Berry, Robert F....Marquette
 Bertucci, J. P.....M
 Bottum, Charles N....Marquette
 Burke, R. A....Palmer
 Casler, W. L....Marquette
 Cooperstock, M....Marquette
 Corcoran, W. A....Ishpeming
 Drury, Chas. P....Marquette
 Elzinga, E. R....Marquette
 Erickson, Arvid W....Ishpeming

Fennig, F. A.....M
 Hanelin, H. A.....M
 Hartt, P. P....Ishpeming
 Hornbogen, D. P.....M
 Janes, R. Grant.....M
 Keskey, George I....Marquette
 Lambert, W. C.....M
 LeGolvan, C....Marquette
 McCann, Neal J....Ishpeming
 Mudge, W. A....Negaunee
 Nicholson, J. B.....M
 Niemi, O. I.....M

Picotte, Wilfred S....Ishpeming
 Robbins, Nelson J....Negaunee
 Sarven, James D....Negaunee
 Schutz, W. J.....M
 Sicotte, IsaiahMichigan
 Swinton, A. L....Marquette
 Talso, JacobIshpeming
 Vanteventer, Vivian H....Ishpeming
 Van Riper, Paul....Champion
 Waldie, George McLeod....Ishpeming
 Wickstrom, GeorgeMunising
 Witters, Josef E....Gwinn

ROSTER MSMS

Mason County

Benjamin, Clayton C.	Ludington
Blanchette, Victor J.	Scottville
Comodo, Nicholas M.	M
Force, Wm. H.	Ludington

Bruggema, Jacob	Evart
Campbell, James B.	Big Rapids
Chess, Leo F.	Reed City
Franklin, Benjamin L.	Remus
Hall, Clifton	Big Rapids

Mecosta-Osceola-Lake Counties

Ivkovich, Paul	M
Kilmer, Paul B.	Reed City
Klein, J. Paul	M
McGrath, V. J.	Reed City
MacIntyre, Donald	Big Rapids

Kirwan, Edward J.	Ludington
Martin, Wm. S.	Ludington
Ostrander, R. A.	M
Paukstis, Charles	Ludington
Spencer, C. M.	Scottville

Medical Society of North Central Counties

Beebe, R. J.	West Branch
Clippert, C. G.	Grayling
Coulter, Keith D.	Gladwin
Drescher, Geo. A.	Lewiston
Egle, Joseph L.	Gaylord
Harris, Levi A.	Gaylord

Corkill, C. C.	Menominee
DeWane, F. J.	M
Flanagan, Clarence B.	Menominee
Heidenreich, John R.	M

Ballmer, Robert S.	Midland
Gay, Harold H.	Midland
Grewé, N. C.	Midland
High, C. V., Jr.	Midland
Howe, Irvin M.	Midland

Acker, Wm. F.	Monroe
Ames, Florence	Monroe
Balk, A. C.	Monroe
Barker, Vincent L.	M
Blakey, L. C.	Monroe
Bond, W. W.	Monroe
Cohen, H. Herbert	M
Denman, D. C.	M
Dusseau, S. V.	Erie
Ewing, R. T.	Monroe
Fieldhouse, B. J.	Ida
Flanders, I. P.	M
Gelhouse, Wm. J.	Monroe

Hendricks, Henning V.	Kalkaska
Jardine, Hugh M.	West Branch
Keyport, C. R.	Grayling
Lanting, Roelof	M
LaPorte, L. A.	Gladwin
Martzowka, M. A.	Roscommon

McDowell, Douglas A.	M
McKillop, G. L.	Gaylord
Peckham, Richard	Gaylord
Sargent, Leland E.	Kalkaska
Stealy, Stanley	Grayling

Peterson, A. R.	Daggett
Sawbridge, Edward	Stephenson
Sethney, Henry T.	Menominee
Sethney, Walter F.	M
Towey, J. W.	Powers

Midland County

Linsenmann, Karl W.	Midland
MacCallum, Charles	Midland
Maynard, W. A.	Coleman
Meisel, Edward H.	M
Pike, Melvin H.	Midland

Rice, Robert E.	Midland
Sachs, Ralph Robert	Midland
Sherk, J. H.	Midland
Sjolander, Gust	Midland
Towsley, W. D.	Midland
Von Haitinger, Kalmon S.	M

Monroe County

Golinvaux, C. J.	Monroe
Goodman, Louis	M
Heffernan, John F.	Carleton
Hensel, Hilda	Monroe
Heustis, Albert E.	Monroe
Hunter, M. A.	M
Johnson, A. Esther	Monroe
Landon, Herbert W.	Monroe
Long, Edgar C.	M
Long, Sara	Monroe
McDonald, T. A.	Monroe
McGeoch, R. W.	Monroe
McMillin, J. H.	Monroe

Meck, H. L.	Dundee
Moreley, Louise	Erie
Parmerlee, O. E.	Lambertville
Penzotti, Stanley	M
Pinkus, Hermann	Monroe
Reisig, A. H.	M
Sanger, Emerson J.	Monroe
Siffer, J. J.	Monroe
Smith, Wm. A.	Petersburg
Stolpestad, C. T.	M
Wagar, Spencer	Rockwood
Williams, Robert J.	M
Williamson, George W.	Dundee

Muskegon County

Anderson, A. J.	Muskegon
August, R. V.	Muskegon Heights
Bartlett, F. H.	Muskegon
Barnard, Helen	Muskegon
Beers, Charles	Muskegon Heights
Benedict, A. L.	M
Bloom, C. J.	Muskegon
Boyd, D. R.	Muskegon
Bradshaw, Park S.	Muskegon
Chapin, William S.	Muskegon Heights
Closz, H. F.	Muskegon
Cohan, Sol G.	Muskegon
Colignon, C. M.	Muskegon
Collier, C. C.	Whitehall
D'Alcorn, Ernest	Muskegon
Dasler, A. F.	M
Derezinski, Clement F.	M
Diskin, Frank	M
Douglas, Robert	M
Durham, C. J.	Muskegon
Dykhuisen, Harold D.	Muskegon
Eckerman, C. T.	Muskegon
Fillingham, Enid	Muskegon
Fleischman, C. B.	Muskegon
Fleishman, Norman	M
Foss, Edward O.	Muskegon

Loughery, H. B.	Muskegon
Mandeville, C. B.	Muskegon
Medema, Paul E.	Muskegon
Meengs, M. B.	M
Miller, Philip L.	M
Morford, F. N.	Muskegon
Morse, Bertram W.	M
Mulligan, A. W.	Muskegon
Oden, Constantine L.	Muskegon
Olson, R. G.	Muskegon Heights
Pangerl, Carl	Muskegon Heights
Petkus, Antonie	Muskegon
Pettis, Emmett	Muskegon
Powers, Lunette	Muskegon
Price, Leonard	M
Pyle, H. J.	Muskegon
Risk, R. A.	Muskegon
Risk, Robert D.	M
Scholle, N. W.	M
Sears, Richard	Muskegon
Stone, Maxwell E.	Muskegon
Swartout, W. C.	Muskegon
Teifer, Charles A.	Muskegon
Thieme, S. W.	Ravenna
Thornton, E. S.	Muskegon
Wilke, C. A.	Montague
Wilson, P. S.	Muskegon

ROSTER MSMS

Newaygo County

Barnum, W. H.	Fremont
Black, B. F.	Holton
Deur, T. R.	Grant
Edwards, Albert	Fremont

Geerlings, Lambert	Fremont
Geerlings, Lewis J.	M
Geerlings, Willis	Fremont
Gordon, B. F.	M

Moore, H. R.	Newaygo
Saxen, Raymond T.	White Cloud
Stryker, O. D.	Fremont
Tompsett, Arthur O.	Hesperia

Northern Michigan County

Benson, A. A.	Mancelona
Beuker, Bernard	East Jordan
Blum, Benjamin B.	Petoskey
Burns, Dean C.	Petoskey
Chapman, Willis Earle	Cheboygan
Conkle, Guy C.	Boyne City
Conti, Joseph	Petoskey
Conway, Wm. S.	M
Duffie, Don Hastings	Central Lake
Frank, Gilbert E.	Harbor Springs
Giffords, Mark	M

Gilpin, John H.	Cheboygan
Hegener, A. J.	Petoskey
Larson, Walter E.	Levering
Lashmet, Floyd H.	Petoskey
Lilga, Harris V.	M
Litznburger, A. F.	Boyne City
Mast, W. H.	Petoskey
Mayne, Frederick C.	Cheboygan
McCarroll, James C.	Cheboygan
McCune, Wm. Stanley	M
McLeod, M. D.	Petoskey
McMillan, Fraley	Charlevoix

McMillan, Lyle D.	Mackinac City
Miller, Samuel	M
Palmer, Russell	St. James
Parks, W. H.	Petoskey
Reed, Wilbur F.	Cheboygan
Rodgers, John	Bellaire
Saltonstall, Gilbert B.	Charlevoix
Slade, H. G.	Onaway
Stringham, J. R.	Cheboygan
Tiffany, A. C.	Mackinac City
Van Dellen, Jerrian	East Jordan
Winter, Joseph A.	Cheboygan

Oakland County

Abbott, V. C.	M
Ankoff, Harry	Pontiac
AschenBrenner, Z. R.	Farmington
Baker, Frederick A.	Pontiac
Baker, Robert H.	Pontiac
Barker, Howard B.	Pontiac
Bauer, Ernest W.	Hazel Park
Beattie, W. G.	Ferndale
Beck, Otto O.	Birmingham
Benning, C. H.	M
Berg, Richard H.	Oxford
Boucher, R. E.	M
Burke, Chauncey G.	Pontiac
Butler, Samuel A.	Pontiac
Campbell, Malcolm D.	M
Carr, Wm. H.	Holly
Christie, Edward D.	Pontiac
Christie, J. W.	M
Church, J. E.	Pontiac
Cobb, Leon F.	Pontiac
Cobb, Thomas H.	Pontiac
Cooper, Robert J.	M
Cottrell, Martha S.	Novi
Couchman, Boyd	Royal Oak
Crissman, Harold C.	Ferndale
Cudney, Ethan B.	Pontiac
Dahlgren, Carl	Keego Harbor
Darling, C. G., Jr.	Pontiac
Dobski, Edwin J.	M
Domeier, L. H.	M
Ekelund, Clifford T.	Pontiac
Farnham, Lucius A.	Pontiac
Faulconer, Albert	M
Francis, Donald	M
Ferris, Ralph G.	Birmingham
Fitzpatrick, Francis	Pontiac
Flick, Earl J.	M
Flick, John R.	Royal Oak
Foust, Earl W.	M
Fox, John W.	Pontiac
Furlong, Harold A.	M
Gaensbauer, Ferdinand	Pontiac
Gariepy, Bernard F.	Royal Oak
Gatley, C. R.	M
Gatley, L. Warren	Pontiac

Geib, Ormond D.	Rochester
German, Frank D.	Pontiac
Gill, Matthew J.	M
Gordon, J. H.	Birmingham
Grant, William A.	Milford
Green, Wm. M.	Pontiac
Halsted, Lee H.	Farmington
Hammer, Carl W.	M
Hammonds, E. E.	M
Harvey, Campbell	Pontiac
Hassberger, J. B.	M
Hathaway, Clarence L.	Lake Orion
Hathaway, William	Rochester
Henry, Colonel R.	Ferndale
Hensley, C. B.	Lake Orion
Howlett, E. V.	Pontiac
Hoyt, D. F.	M
Hubert, John R.	M
Huffman, M. R.	Milford
Hume, T. W. K.	Auburn Heights
Hurst, Daniel D.	Pleasant Ridge
Hutchinson, W. G.	Pontiac
Jones, Morrell M.	Drayton Plains
Kemp, Felix J.	Pontiac
Kemp, W. Lloyd	Birmingham
Kimball, A. S.	Pontiac
Kirkup, Norman N.	M
Lambie, John S.	Pontiac
Lambert, Alvin Gerald	Ferndale
Larson, B. T.	Pontiac
Lass, E. H.	M
Lawler, C. F.	Birmingham
Lewis, S. M.	Ferndale
Little, J. W.	M
Lockwood, C. E.	Holly
MacKenzie, O. R.	Walled Lake
Morgrave, Edmund D.	Royal Oak
Markley, John M.	M
Mason, Robert J.	M
McConkie, J. P.	Birmingham
McEvoy, Francis J.	M
McNeill, H. H.	Pontiac
Meinke, Herman A.	Hazel Park
Mercer, Frank A.	Pontiac
Mitchell, B. M.	Pontiac
Monroe, John D.	Pontiac
Mooney, C. A.	Ferndale

Needle, Francis	M
Newcomb, Arnold B.	Berkley
Norup, John	Berkley
Nosanchuk, Joseph	M
Ohlmacher, A. P.	M
Olsen, Richard E.	M
Osgood, S. W.	M
Pauli, Theodore H.	M
Pool, H. H.	Pontiac
Pelletier, Charles J.	M
Porritt, Ross J.	M
Ports, Preston W.	M
Raynale, George P.	Birmingham
Reid, Fred T.	Clawson
Rennell, E. J.	Pontiac
Riker, Aaron D.	Pontiac
Roehm, Harold R.	Birmingham
Rowley, Laurie G.	Drayton Plains
Russell, Vincent P.	M
St. John, Harold A.	Pontiac
Schlecte, Carl	M
Schlecte, Eve M.	Rochester
Schoenfeld, John B.	M
Schuneman, Howard	Ferndale
Seaborn, A. J.	Royal Oak
Shadley, Maxwell	M
Shaw, Nenian T.	Birmingham
Simpson, E. K.	Pontiac
Smith, Carlton A.	M
Smith, Ellen	Pontiac
Smith, Donald S.	M
Spears, M. L.	Pontiac
Spencer, Lloyd H.	M
Spohn, Earl W.	M
Stahl, Harold F.	Oxford
Stanley, Wm. F.	M
Starker, Charles T.	Pontiac
Steinberg, Norman	Royal Oak
Stolzman, A. K.	M
Sutton, Palmer E.	Royal Oak
Tuck, Raymond G.	Pontiac
Ulott, Milton J.	Ortonville
Vatz, Jack A.	Pontiac
Wagley, P. V.	M
Watson, Thomas Y.	M
Wentz, A. E.	M
Young, Arthur R.	Pontiac

Oceana County

Heysett, Norman W.	Ft. Wayne, Ind.
Jensen, Viggo	Shelby
Lemke, Walter M.	M
Munger, L. P.	Hart

Nicholson, John H.	Hart
Reetz, Fred A.	Shelby
Robinson, W. Gordon	M
Wood, Merle G.	Hart

Ontonagon County

Pinkerton, W. J.	Ontonagon
Rubinfeld, S. H.	M

Strong, W. F.	Ontonagon
Whiteshield, C. F.	Trout Creek

Ottawa County

Kemme, Gerrit	Zeeland
Kitchel, John	Grand Haven
Kitchel, Mary	Grand Haven
Kools, Wm. Clarence	Holland
Leenhouts, Abraham	Holland
Long, C. E.	Grand Haven
Nichols, Rudolph H.	Holland
Nykamp, Russell	Zeeland
Presley, Wm. J.	Grand Haven
Rypkema, Willard M.	M

Stickley, A. E.	Coopersville
Ten Have, Ralph	Grand Haven
Timmerman, E. C.	M
Van Appledorn, Chester J.	Holland
Van Der Berg, E.	Holland
Van der Velde, O.	Holland
Westgate, William	Holland
Wiersma, Silas C.	Hudsonville
Winter, John K.	Holland
Winter, Wm. G.	Holland

ROSTER MSMS

Saginaw County

Ackerman, G. L.	Saginaw		M	Meyer, Henry J.	Saginaw
Anderson, W. K.	Saginaw			Moon, A. R.	Saginaw
Bagley, U. S.	Saginaw			Mikan, V. Robert	Saginaw
Bagshaw, David E.	Saginaw			Mudd, Richard D.	M
Berberovich, T. F.	Saginaw			Murphy, Albert P.	Saginaw
Bishop, H. M.	M			Murray, Chas. R.	M
Brender, Fred P.	Frankenmuth			Nicholas, Mildred	Saginaw
Brock, W. H.	Saginaw			Novy, F. O.	Saginaw
Bruton, Martin F.	Saginaw			O'Reilly, Wm. J.	Saginaw
Busch, Frank J.	Saginaw			Ostrander, Frank W.	Freeland
Butler, M. G.	M			Phillips, Homer A.	M
Button, A. C.	Saginaw			Pietz, Frederick	Saginaw
Cady, F. J.	Saginaw			Pillsbury, Edward A.	Frankenmuth
Cameron, Allen K.	Saginaw			Potvin, Clifford D.	M
Campbell, L. A.	Saginaw			Richards, Ned W.	M
Catzone, R. J.	Merrill			Richter, Harry J.	M
Chisena, Peter E.	M			Ryan, M. D.	Saginaw
Clark, Wilbert B.	Saginaw			Ryan, R. S.	Saginaw
Claytor, Archer A.	Saginaw			Sample, J. T.	Saginaw
Cortopassi, Andre	Saginaw			Sargent, D. V.	M
Cortopassi, V. E.	M			Schaiberger, Elmer	Saginaw
Cory, C. W.	M			Schneider, Alexander	M
Curts, James	M			Sheldon, S. A.	M
Durman, Donald	Saginaw			Skowronski, Casimer A.	M
Ely, C. W.	Saginaw			Slack, Walter K.	M
Ernst, Arthur R.	Saginaw			Stander, A. C.	M
Eymar, Esther	Saginaw			Stewart, George W.	M
Fleschner, Thomas E.	Birch Run			Stiller, A. F.	Saginaw
Gage, David P.	Saginaw			Thomas, Dale	Saginaw
Galsterer, Edwin C.	Saginaw			Tiedke, G. E.	M
Gerber, Herbert	M			Toshach, C. E.	Saginaw
Goman, Louis D.	Saginaw			Wallace, Herbert C.	M
Grigg, Arthur	Saginaw			Westlund, Norman	Saginaw
Grigg, Arthur P.	M			Wilson, H. Roy	Saginaw
				Yntema, S.	M

Sanilac County

Blanchard, E. W.	Deckerville			Hart, R. K.	Croswell
Ellis, N. J.	Croswell			Koch, D.	M
Gift, W. A.	Marlette			Learmont, H. H.	Croswell
Gordon, Vida H.	Sandusky			McGuneagle, K. T.	Sandusky

Norgaard, Hal V.	M
Seager, M. Cole	Brown City
Tweedie, G. Evans	Sandusky
Tweedie, S. Martin	Sandusky
Webster, John C.	Marlette

Shiawassee County

Alexander, Reuben G.	Laingsburg			Greene, I. W.	Owosso
Arnold, Alfred L., Jr.	Owosso			Hoshal, Vern L.	Durand
Arnold, A. L., Sr.	Owosso			Hume, Arthur M.	Owosso
Backe, John C.	M			Hume, Harold A.	Owosso
Brandel, J. M.	M			Janci, Julius	M
Brown, Richard J.	M			Kaufman, H. J.	M
Buzzard, Walter D.	M			Linden, V. E.	M
Cramer, George L. G.	Owosso			McKnight, E. R.	M
Crane, C. A.	Corunna			Parker, W. T.	Owosso
Fillinger, W. B.	Ovid			Pochert, R. C.	Owosso

Richards, C. J.	Durand
Shepherd, W. F.	M
Slagh, E. M.	M
Soule, Glenn T.	Henderson
Watts, Fred A.	Owosso
Weinkauf, W. F.	Corunna
Weston, C. L.	Owosso
Wilcox, Anna L.	Owosso
Wilcox, C. M.	M

St. Clair County

Armsbury, A. B.	Marine City		M	Clyne, B. C.	Port Huron
Atkinson, J. M.	Port Huron			Cooper, T. H.	Marine City
Attridge, J. A.	Port Huron			DeGurze, T. E.	Marysville
Banting, K. C.	Port Huron			Derk, W. P.	Port Huron
Battley, J. C. S.	Port Huron			Fraser, Robert C.	Port Huron
Beck, Frank K.	Port Huron			Hall, W. E. B.	Port Huron
Biggar, R. J.	M			Heavenrich, Theodore F.	Port Huron
Borden, C. L.	Yale			Holcomb, R. J.	Marine City
Boughner, W. H.	Algonac			Kesl, Geo. Matthew.	Port Huron
Bovee, M. E.	Port Huron			Le Galley, K. B.	M
Brush, Howard O.	Port Huron			Licker, R. R.	M
Burke, Ralph M.	Port Huron			Ludwig, F. E.	M
Burley, Jacob H.	Port Huron			Martin, C. S.	Port Huron
Callery, A. L.	Port Huron			McColl, D. J.	Port Huron
Campbell, R. H.	St. Clair			McColl, Neil J.	Port Huron
Carey, Lewis M.	Detroit			Meredith, E. W.	Port Huron
Carney, F. V.	St. Clair			Patterson, D. Webster	Port Huron

Pollack, Donald A.	Yale
Reynolds, Annie E.	Port Huron
Ryerson, W. W.	Port Huron
Schaefer, W. A.	Port Huron
Searles, Karl F.	Capac
Sites, E. C.	Port Huron
Thomas, C. F.	Port Huron
Treadgold, Douglas	Port Huron
Vroman, M. E.	Port Huron
Waltz, J. F.	Capac
Ware, John R.	Port Huron
Wass, Henry C.	St. Clair
Waters, George	Port Huron
Wellman, Joseph E.	Port Huron
Wight, William G.	Yale
Witter, Gordon L.	M
Zemmer, A. L.	Port Huron

St. Joseph County

Berg, Lawrence A.	M			Kane, David M.	Sturgis
Brunson, A. E.	Colon			Miller, C. G.	Sturgis
Buell, Martin	M			Parrish, Marion	Sturgis
Dodrill, F. D.	Ann Arbor			Pennington, H. C.	White Pigeon
Fiegel, S. A.	M			Porter, C. G.	Three Rivers
Fortner, R. J.	Three Rivers			Raisch, Fred J.	M
Hoekman, Aben	M			Reed, Fred R.	Three Rivers
Holm, Arvid G.	M			Rice, John W.	M

Shaw, G. D.	M
Sheldon, J. P.	M
Slote, L. K.	Constantine
Springer, R. A.	Centerville
Sweetland, G. J.	Constantine
Weir, Dale C.	Three Rivers
Wilkerson, Nina C.	Sturgis
Zimont, R. D.	M

ROSTER MSMS

Tuscola County

Barbour, Harry A.	Mayville
Bates, George	Kingston
Berman, Harry	Millington
Cook, George Harvey	Caro
Cook, Raymond	Akron
Dickerson, Willard W.	Caro
Dixon, Robert J.	Caro
Donahue, Theron	Cass City
Fisher, Robert E.	M
Flett, Richard O.	Millington

Rundell, Annie Stevens	Vassar
Ruskin, D. B.	Caro
Savage, Lloyd L.	Caro
Shoemaker, J.	Vassar
Spohn, U. G.	Fairgrove
Starmann, Bernard	Cass City
Swanson, E. C.	Vassar
Vail, Harry F.	M
Von Renner, Otto	Vassar

Van Buren County

Boothby, F. M.	Lawrence
Bope, William P.	Decatur
Buckborough, M. W.	South Haven
Diephus, Bert	M
French, Merle R.	Paw Paw
Gano, Avison	M
Giddings, Ralph R.	M
Giffen, John R.	Bangor
Greenman, Newton H.	Decatur

Hall, E. J.	M
Hasty, Willis A.	M
Hoyt, W. F.	Paw Paw
Iseman, Joseph W.	M
Itzen, J. F.	South Haven
Laird, Emma	Paw Paw
Lowe, Edwin G.	Bangor
Maxwell, J. Charles.	Paw Paw
McNabb, A. A.	Lawrence

Murphy, Norman B.	Bangor
Penoyer, C. L.	South Haven
Sayre, Phillip P.	South Haven
Spalding, R. W.	Gobles
Steele, Arthur H.	Paw Paw
TenHouten, Chas.	M
Terwilliger, Edwin	M
Urist, Martin J.	South Haven
Williams, F. N.	Hartford
Young, William R.	Lawton

Washtenaw County

Agate, George H.	M
Alexander, John	Ann Arbor
Armstrong, Richard O.	M
Badgley, Carl E.	Ann Arbor
Barker, Paul	Ann Arbor
Barnes, Allan C.	M
Barnwell, John B.	Ann Arbor
Barr, A. S.	Ann Arbor
Barss, Harold D.	Ypsilanti
Bassow, Paul H.	Ann Arbor
Baugh, R. H.	Milan
Beebe, Hugh M.	Ann Arbor
Bell, Margaret	Ann Arbor
Belsler, Walter	Ann Arbor
Blair, Thomas H.	M
Brace, William M.	Ann Arbor
Breaky, J. F.	Ann Arbor (Ret.)
Britton, H. B.	Ypsilanti
Brown, Phillip	Ypsilanti
Bulmer, Dan J.	M
Burge, Curtis H.	Ann Arbor
Buscaglia, C. J.	M
Camp, Carl Dudley	Ann Arbor
Clements, Glenn T.	Ann Arbor
Cody, Claude C.	Ann Arbor
Coller, Frederick A.	Ann Arbor
Conger, Kyrl B.	M
Cooper, James H.	Ann Arbor
Cooper, Ralph Ruehl	M
Coxon, Alfred W.	Ann Arbor
Crabtree, Peter	M
Cummings, H. H.	Ann Arbor
Curtis, Arthur C.	Ann Arbor
Davis, Fenmore E.	M
Day, A. Jackson	M
De Jong, Russell	Ann Arbor
DeTar, John S.	Milan
DeWeese, David D.	Ann Arbor
Dimitroff, Sim	Ann Arbor
Dingman, Reed O.	Ann Arbor
Donaldson, S. W.	Ann Arbor
Downan, Charles E.	M
Duff, Ivan F.	M
Dunstone, H. C.	Ypsilanti
Engelke, Otto K.	Ann Arbor
Failing, Joseph H.	Ann Arbor
Falls, Harold F.	Ann Arbor
Farrior, J. Brown	M
Finley, Helen L.	Ann Arbor
Fitzgerald, Thomas D.	M
Forbes, Stephen A.	Ann Arbor
Forsythe, Warren E.	Ann Arbor
Foster, D. Bernard	Ann Arbor
Fralick, F. Bruce	Ann Arbor
Freyberg, Richard H.	Ann Arbor
Frye, Carl H.	Ann Arbor

Ganzhorn, Edwin	Ann Arbor
Gardiner, Sprague	M
Gates, Neil A.	Ann Arbor
Green, Mervin E.	M
Gulde, Andros	Chelsea
Hagerman, George W.	M
Hammond, George	M
Hammond, W. W.	Plymouth
Handorf, Heinrich Hugo	Northville
Hannum, M. R.	Milan
Haynes, Harley A.	Ann Arbor
Henry, L. Dell	Ann Arbor
Healey, Claire E.	Ann Arbor
High, Howard C.	M
Himler, Leonard E.	Ann Arbor
Hirschfeld, Alex H.	M
Hodges, Fred J.	Ann Arbor
Holt, John F.	Ann Arbor
Howard, S. C.	Ann Arbor
Howes, Homer A.	M
Jay, Baird D.	Ann Arbor
Jenkins, Richard L.	Ann Arbor
Jimenez, Buenaventura	Ann Arbor
Johnson, Lester J.	M
Johnston, Franklin D.	Ann Arbor
Jordan, Paul H.	M
Kahn, Edgar A.	M
Keller, Arthur P.	M
Kemper, J. W.	Ann Arbor
Kennedy, John O.	Ann Arbor
Kiehn, Clifford	M
Kleinschmidt, Gladys	Toledo, Ohio
Klingman, Theophil	Ann Arbor
Knoll, Leo A.	Ann Arbor
Kretzschmar, Norman R.	Ann Arbor
La Fever, Sidney L.	Ann Arbor
Lampe, Isadore	Ann Arbor
Law, John L.	Ann Arbor
Levin, Manuel	M
Lichty, Dorman E.	Ann Arbor
List, Carl F.	Ann Arbor
Lowell, Vivion F.	M
Lynn, Harold P.	Ypsilanti
Lyons, Richard H.	Ann Arbor
McIntyre, Dugald S.	M
Malcolm, Karl D.	Ann Arbor
Marshall, Mark	Ann Arbor
Maxwell, James H.	Ann Arbor
McCotter, Rollo E.	Ann Arbor
McEachern, Thomas H.	Ann Arbor
McKann, Charles F.	Ann Arbor
Metzger, Ida	Ypsilanti
Milford, Albert F.	Ypsilanti
Miller, Harold	M
Miller, Norman F.	Ann Arbor
Moore, Donald F.	M
Muehlig, George F.	Ann Arbor

Myers, Dean W.	Ann Arbor
Nesbit, Reed M.	Ann Arbor
Newton, Chas. W.	Ann Arbor
Olyphant, L. W.	Ann Arbor
Patterson, Ralph M.	Ann Arbor
Peet, Max	Ann Arbor
Pillsbury Charles B.	Ypsilanti
Pollard, H. M.	Ann Arbor
Power, Frank H.	M
Price, Helen F.	Ann Arbor
Prout, Gordon J.	Saline
Quirk, Edmund J.	Chelsea
Rague, Paul O.	M
Ransom Henry	Ann Arbor
Raphael, Theophile	Ann Arbor
Ratliff, Rigdon K.	Ann Arbor
Reynolds, Stephen	M
Riecker, H. H.	Ann Arbor
Riggs, Harold W.	Ann Arbor
Robb, David N.	Ypsilanti
Rosenbaum, Francis F.	Ann Arbor
Sacks, Wilma	Ann Arbor
Salon, Dayton D.	M
Schumacker, W. E.	Ann Arbor
Scott, Robert R.	M
Scott, William C.	M
Scurry, Maurice McL.	M
Seivers, Maurice H.	Ann Arbor
Seime, Reuben I.	Ypsilanti
Sink, Emory W.	Ann Arbor
Smalley, Marianna	Ann Arbor
Smith, Joseph G.	M
Snow, Glenadine	Ypsilanti
Solis, Jeanne C.	Ann Arbor
Soller, M. E.	Ypsilanti
Sturgis, Cyrus C.	Ann Arbor
Sundwall, John	Ann Arbor
Teed, Reed Wallace	M
Thieme, E. Thurston	M
Towsley, Harry A.	M
Vander Slice, David	Ann Arbor
Waggoner, R. W.	Ann Arbor
Waldron, Alexander M.	M
Wallace, J. B.	Saline (Ret.)
Wanstrom, Ruth C.	Ann Arbor
Washburne, Charles L.	Ann Arbor
Watson, Ernest H.	Ann Arbor
Weller, Carl V.	Ann Arbor
Wessinger, John A.	Ann Arbor
Wile, Udo J.	M
Williams, Howard R.	Ann Arbor
Wisdom, Inez	Ann Arbor
Woods, J. J.	Ypsilanti
Worth, Melissa H.	Ypsilanti
Wright, Walter J.	Ypsilanti
Wylie, Wm. C.	Dexter
Yoder, O. R.	Ypsilanti

Wayne County

Agnelly, Edward J.	Detroit
Agnew, George H.	Detroit
Alderman, R. F.	Detroit
Aldrich, Napier S.	M
Alford, E. S.	Belleville
Allen, John V.	Lincoln Park
Alles, Russell W.	Detroit
Allison, Frank B.	Detroit

Allison, Herbert C.	Grosse Pointe Farms
Altshuler, Abraham M.	Detroit
Altshuler, Ira M.	Detroit
Altshuler, Samuel S.	M
Amberg, Emil	Detroit
Amos, Thomas G.	Detroit
Anderson, Bruce	Detroit

ROSTER MSMS

Anderson, Gordon H.	M	
Anderson, J. O.	Detroit	
Anderson, Walter L.	M	
Anderson, Walter T.	Detroit	
Andries, Joseph H.	Detroit	
Andries, Raymond C.	Detroit	
Angel, John J.	Wayne	
Ankley, J. W.	Detroit	
Annessa, Dommenico Marcill	Detroit	
Anslow, Robert E.	Detroit	
Appel, Phillip R.	Detroit	
Appelman, H. B.	Detroit	
Arehart, Burke W.	M	
Armstrong, Arthur G.	Detroit	
Arnold, Effie	Detroit	
Aronstam, Noah E.	Detroit	
Ascher, Meyer S.	M	
Ashe, Stilson R.	Detroit	
Ashley, L. Byron	M	
Ashton, F. B.	Highland Park	
Asselin, J. L.	Detroit	
Asselin, Regis F.	M	
Athay, Roland M.	Detroit	
Atchison, Russell M.	Northville	
Atler, Lawrence R.	Detroit	
Atler, Leroy L.	M	
August, Harry E.	Detroit	
Axelrod, Stanley H.	Detroit	
Axelson, A. U.	Detroit	
Babcock, Kenneth B.	M	
Babcock, L. K.	Detroit	
Babcock, Myra E.	Detroit	
Babcock, W. W.	Detroit	
Bach, Walter F.	Detroit	
Bachman, Morris E.	Detroit	
Bacon, Vinton A.	Detroit	
Baer, George J.	Detroit	
Baer, Raymond B.	Detroit	
Baef, Michael A.	Detroit	
Bagley, Harry E.	M	
Bailey, Carl C.	Detroit	
Bailey, Don A.	Detroit	
Bailey, Louis J.	Detroit	
Baker, Clarence	Detroit	
Baker, Howard B.	Detroit	
Balaga, F. T.	Detroit	
Balcerski, Matthew A.	Detroit	
Ballard, Charles S.	Detroit	
Balser, Charles W.	Detroit	
Baltz, James I.	Detroit	
Baranowski, A. W.	Detroit	
Barker, F. Marion	Grosse Pointe	
Barnett, Louis L.	M	
Barnett, Saul E.	Detroit	
Barone, Charles J.	Highland Park	
Barrett, Wyman D.	Detroit	
Bartemeier, Leo H.	Detroit	
Barton, J. R.	Detroit	
Bates, Gaylord S.	M	
Bauer, Benedict J.	Detroit	
Bauer, A. Robert	Detroit	
Bauer, Lester Eugene	M	
Baumann, W. L.	Detroit	
Baumer, Moe	M	
Baumgarten, Elden C.	Detroit	
Bayles, John G.	Detroit	
Beach, Watson	Detroit	
Beam, A. Duane	M	
Beaton, Colin	M	
Beattie, Robert	Detroit	
Beatty, S. M.	Detroit	
Beaver, Donald C.	Detroit	
Beck, Eva F.	Eloise	
Becker, Abraham	M	
Becklein, C. L.	Detroit	
Beckwitt, M. C.	M	
Bedell, A.	Detroit	
Beer, Joseph F.	M	
Beeuwkes, L. E.	M	
Begle, Howell L.	Detroit	
Behn, Claud W.	Detroit	
Beigler, Sydney K.	Detroit	
Beitman, Max R.	M	
Belanger, Ernest E.	M	
Belanger, Henry	Detroit	
Belknap, Warren F.	M	
Bell, J. Kenner	Detroit	
Bell, William M.	Detroit	
Bennett, Germany E.	Detroit	
Bennett, Harry B.	Detroit	
Bennett, Zina B.	Detroit	
Benson, C. D.	M	
Benson, Davis A.	M	
Bentley, Frederick E.	Plymouth	
Bentley, Neil I.	Detroit	
Berent, Morris S.	Detroit	
Beresh, Louis	M	
Berge, Clarence A.	Detroit	
Bergman, Murray Stewart	Detroit	
Bergo, Howard L.	M	
Berke, Sydney S.	Detroit	
Berkey, William E.	Detroit	
Berlien, Ivan C.	M	
Berman, Harry S.	Detroit	
Berman, Lawrence	Detroit	
Berman, Robert	Detroit	
Berman, Sidney	M	
Bernard, Walter G.	Detroit	
Bernbaum, Bernard	Detroit	
Bernstein, Albert E.	Detroit	
Bernstein, Samuel S.	M	
Berry, Joseph E.	Detroit	
Besanson, J. H.	Detroit	
Best, T. H. Edward	Detroit	
Bicknell, Edgar A.	M	
Bicknell, Frank B.	M	
Bicknell, Nathan J.	Detroit	
Biddle, Andrew P.	Detroit	
Birch, John R.	M	
Birkelo, Carl C.	Detroit	
Bittker, I. Irving	Detroit	
Bittrich, Norbert M.	Detroit	
Black, Perry S.	Detroit	
Blackford, Roger W.	Detroit	
Blain, Alexander W.	Detroit	
Blain, James H. Jr.	M	
Blair, K. E.	Detroit	
Blashill, James B.	M	
Bleier, Joseph	Detroit	
Bloch, Abraham	Detroit	
Blodgett, William E.	Detroit	
Blodgett, William H.	M	
Bloom, Arthur R.	Detroit	
Blumenthal, Franz L.	Detroit	
Boccacio, John	M	
Boccia, James J.	M	
Boddie, Arthur W.	Detroit	
Boehm, John D.	Detroit	
Boell, Arthur F.	Detroit	
Bogusz, Ladislaus	Eloise	
Bohn, Stephen	M	
Boileau, Thornton I.	M	
Boles, A. E.	M	
Bookmyer, R. H.	Detroit	
Bookstein, Abraham M.	M	
Bovill, E. G.	M	
Bower, Franklin T.	Detroit	
Bowers, Leo J.	Detroit	
Bowman, Frank E.	Detroit	
Boyd, John H.	Trenton	
Brachman, D. S.	Detroit	
Bracken, Andrew H.	Dearborn	
Bradford, Henry	M	
Bradley, George	Detroit	
Bradshaw, William H.	Detroit	
Braitman, Louis	Detroit	
Braley, W. N.	Detroit	
Bramigk, F. W.	Detroit	
Brand, Benjamin	Detroit	
Brando, Russell G.	Detroit	
Brandt, Edward L.	Detroit	
Braun, Lionel	M	
Breitenbecher, E. R.	Detroit	
Brengle, Deane R.	Detroit	
Breon, Guy L.	Detroit	
Briegel, Walter A.	Detroit	
Brines, O. A.	M	
Bringard, Elmer L.	M	
Brisbois, Harold J.	Plymouth	
Brodersen, Harvey S.	River Rouge	
Bromme, William	Detroit	
Brooks, A. L.	Detroit	
Brooks, Clark D.	Detroit	
Brooks, Charles W.	M	
Brooks, Nathan	M	
Brosius, William L.	Detroit	
Broudo, Philip H.	Detroit	
Brough, Glen A.	M	
Brown, A. O.	Detroit	
Brown, Carlton F.	M	
Brown, George Francis	Detroit	
Brown, Gordon T.	Detroit	
Brown, Harvey F.	Detroit	
Brown, Henry S.	Detroit	
Brown, John R.	M	
Brown, Stanley H.	Detroit	
Brown, Thomas A.	Detroit	
Brownell, Paul G.	M	
Bruel, Richard A.	Detroit	
Brunk, Andrew S.	Detroit	
Brunk, C. F.	Detroit	
Brunke, Bruno B.	Detroit	
Brush, Brock Edwin	Detroit	
Bryce, John D.	M	
Buchanan, W. Paul	Detroit	
Buchner, Harold W.	M	
Buck, John D.	Detroit	
Budson, Daniel	Detroit	
Buell, Charles E. Jr.	Detroit	
Buesser, Frederick G.	Detroit	
Burgess, Charles M.	Detroit	
Burgess, Jay M.	Detroit	
Burns, Robert T.	Detroit	
Burnham, David C.	Detroit	
Burnstine, Julius Y.	Detroit	
Burnstine, Perry P.	M	
Burr, George C.	Detroit	
Burr, H. Leonard	Grosse Pointe	
Burrows, Howard A.	Dearborn	
Burton, D. T.	Detroit	
Bush, Glendon J.	M	
Bush, Lowell M.	Detroit	
Buss, John A.	Detroit	
Butler, Harry J.	Detroit	
Butler, L. H.	Detroit	
Butler, Volney N.	Detroit	
Butterworth, Herman K.	Lincoln Park	
Buttrum, Edward J.	M	
Byers, Dudley W.	Detroit	
Byington, Garner M.	Detroit	
Caldwell, J. Ewart	M	
Calkins, H. N.	M	
Callaghan, T. T.	M	
Cameron, A. H.	Wyandotte	
Campau, George H.	Detroit	
Campbell, Duncan A.	Detroit	
Campbell, Mary B.	Detroit	
Candler, Clarence L.	Detroit	
Canter, Allie L.	Detroit	
Canter, Gayle E.	M	
Caplan, Leslie	M	
Caraway, James E.	M	
Carey, Cornelius	Detroit	
Carleton, L. H.	Detroit	
Carlson, Harold W.	Detroit	
Carlucci, Peter F.	Detroit	
Carmichael, E. K.	Detroit	
Carnes, Harry E.	M	
Carp, Joseph	M	
Carpenter, C. H.	Detroit	
Carpenter, C. J.	Detroit	
Carpenter, Glenn B.	Detroit	
Carr, J. G.	Detroit	
Carroll, E. H.	Detroit	
Carson, Herman J.	Detroit	
Carstens, Henry R.	M	
Carter, John M.	Detroit	
Carter, L. F.	Detroit	
Cassidy, William J.	Detroit	
Castrop, C. W.	Dearborn	
Cathcart, Edward	M	
Catherwood, Albert E.	Detroit	
Caton, Dorothy	Detroit	
Caughey, Edward H.	M	
Cavell, Roscoe William	M	
Cetlinski, Constantine A.	Hamtramck	
Chall, Henry G.	Detroit	
Chalat, Jacob H.	Detroit	
Chance, J. H.	Detroit	
Chapman, Aaron L.	Detroit	
Chapman, Everett L.	Detroit	
Chapman, Paul T.	Detroit	
Chapnick, H. A.	M	
Chase, Clyde H.	Detroit	
Chatel, Arthur N.	Detroit	
Chene, George C.	Detroit	
Chenik, Ferdinand	Detroit	
Chester, W. P.	Detroit	
Chesluk, H. M.	M	
Childs, George Millard	M	
Chipman, W. A.	Detroit	
Chittenden, George E.	M	
Chittick, William R.	San Diego, Calif.	
Christensen, C. A.	Dearborn	
Christopher, James G.	Detroit	
Chrouch, Laurence A.	Detroit	
Cioffari, Mario S.	Detroit	
Cipriani, Joseph E.	Detroit	
Clapper, Muir	Detroit	
Clark, Benjamin W.	M	
Clark, C. M.	Detroit	
Clark, Donald K.	Dearborn	
Clark, Donald V.	Detroit	
Clark, George E.	Detroit	
Clark, Harold E.	Detroit	
Clark, Harry G.	Detroit	
Clark, Harry L.	Detroit	
Clark, Raymond L.	Detroit	
Clarke, Daniel M.	Detroit	
Clarke, Emilie Arnold	Detroit	
Clarke, George L.	Detroit	
Clarke, Niles A.	M	
Clarke, Norman E.	Detroit	
Clifford, Charles H.	Detroit	
Clifford, John E.	M	
Clifford, Thomas P.	M	
Clippert, J. C.	Grosse Ile	
Coan, Glenn L.	Wyandotte	
Coates, Carl Amos	Dearborn	
Cobane, John H.	Detroit	
Cochrane, Edgar G.	Detroit	
Cohn, Daniel E.	M	
Cohoe, Don A.	Detroit	
Cole, Fred H.	Detroit	
Cole, James E.	Detroit	
Cole, Wyman C. C.	M	
Coleman, Margarete W.	Detroit	
Coleman, William G.	Redford	
Coll, Howard R.	Detroit	
Collings, M. Raymond	Detroit	
Collins, Arthur D.	M	
Collins, Edmund F.	Detroit	
Collins, James D.	Detroit	
Colvin, Leslie T.	Detroit	

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Colyer, Raymond G.	Detroit	Downer, Ira G.	Detroit
Connelly, Basil L.	Detroit	Doyle, George H.	Detroit
Connelly, Richard C.	Detroit	Drake, Ellet H.	M
Connolly, Frank	Detroit	Drake, James J.	Detroit
Connolly, John P.	Detroit	Drews, Robert S.	Detroit
Connor, Guy L.	Detroit	Drinkaus, Harold I.	Detroit
Connors, J. J.	Detroit	Droock, Victor	Detroit
Conrad, E. R.	Detroit	Drummond, Donald L.	Detroit
Constable, Canute G.	Detroit	Dubnove, Aaron	Detroit
Cook, James C.	M	DuBois, Paul W.	Detroit
Cooksey, Warren B.	M	Dubpernell, Karl	Detroit
Coolidge, Maria Belle	Grosse Pte. Park	Dubpernell, Martin S.	Detroit
Cooper, E. L.	Detroit	Ducey, Edward F.	M
Cooper, James B.	Detroit	Duffy, Edward A.	Detroit
Corbeille, Catherine	Detroit	Dudek, John J.	Wyandotte
Coseglia, Robert P.	Detroit	Dundas, E. M.	Detroit
Costello, Russell T.	Detroit	Dunlap, Henry A.	Detroit
Cotruo, L. D.	Detroit	Dunlap, Samson F.	Detroit
Cotton, S. O.	Detroit	Dunn, Cornelius E.	Detroit
Coucke, Henry O.	M	Durocher, Edmund J.	Ecorse
Coulter, William J.	Detroit	Durocher, Normand E.	M
Cowan, Wilfrid	Detroit	Dutchess, Charles E.	Detroit
Cowen, Leon B.	Detroit	Dwaihy, Paul	Detroit
Cowen, Robert L.	Detroit	Dwyer, Francis	M
Coyne, Douglas Ruthven	Detroit	Dysarz, T. T.	Detroit
Craig, Henry R.	Eloise	Dziuba, John J.	M
Craig, Roy D.	Detroit	Eades, Charles C.	M
Crane, Langdon T.	Detroit	Eakins, Frederick J.	Dearborn
Crawford, Albert S.	Detroit	Eaton, Crosby D.	Detroit
Cree, Walter J.	Detroit	Eder, Joseph R.	M
Crews, Thomas H.	Detroit	Eder, Samuel J.	Detroit
Croll, L. J.	M	Edgar, Irving I.	Detroit
Cross, Harold E.	Detroit	Edgar, Russell G.	Detroit
Crossen, Henry F.	Detroit	Edwards, J. W.	Detroit
Croushore, J. E.	M	Eisman, Clarence H.	Detroit
Cruikshank, Alexander	Detroit	Elliott, William G.	Detroit
Culp, Ormond	M	Ellis, Seth W.	M
Curhan, Joseph Howard	Detroit	Elvidge, Robert J.	Detroit
Curry, F. S.	Detroit	Emmert, Herman C.	Detroit
Curtis, Frank E.	Detroit	Engel, Earl H.	M
Cushing, Russell G.	Detroit	Ensign, Dwight C.	Detroit
Cushman, H. P.	Detroit	Ensing, Osborn	Detroit
Dale, Esther H.	Detroit	Epstein, S. G.	M
Dana, Harold M.	M	Erickson, Milton H.	Eloise
Danforth, J. C.	Detroit	Erkitz, Arthur W.	Detroit
Danforth, M. E.	Detroit	Erman, Joseph M.	Detroit
Daniels, L. E.	Detroit	Eschbach, Joseph W.	M
Darling, Milton A.	Detroit	Estabrook, Bert U.	Detroit
Darpin, Peter H.	Detroit	Ettinger, Clayton J.	Detroit
Davidson, Harry O.	M	Evans, Leland S.	Redford
Davies, Thomas S.	Detroit	Evans, William A., Jr.	M
Davies, Windsor S.	M	Ewing, C. H.	M
Davis, Egbert F.	Detroit	Falick, Mordecai Louis	M
Davis, George H.	M	Falk, Ira E.	Detroit
Davis, Lindon Lee	M	Fallis, Lawrence S.	Detroit
Dawson, F. E.	Detroit	Fandrich, Theodore	M
Dawson, W. A.	Inkster	Farbman, Aaron A.	Detroit
Day, J. Claude	M	Fauman, David H.	Detroit
Defever, Cyril R.	M	Faunce, Sherman P.	Detroit
Defnet, William A.	Detroit	Fay, George E.	Detroit
DeGroat, Albert	M	Felcyn, W. George	Detroit
DeHoratiis, Joseph	Detroit	Feldstein, Martin Z.	M
DeJongh, Edwin	Detroit	Fellers, Ray L.	Detroit
Delbert, Stewart G.	M	Fellman, Abraham R.	Detroit
Demaray, John F.	Detroit	Fenech, Harold B.	M
Dempster, James H.	Detroit	Fenton, E. H.	Detroit
DeNike, A. James	Detroit	Fenton, Meryl M.	M
Denis, George M.	Detroit	Fenton, Russell F.	Detroit
Denison, Louis L.	Detroit	Fenton, Stanley C.	Detroit
DePonio, Sylvester A.	Detroit	Ferguson, Franklin F.	M
Derby, Arthur P.	Detroit	Ferrara, Louis V.	M
Derleth, Paul E.	Detroit	Ferrara, Virginia M.	Detroit
DeTomasi, Rome Q.	Detroit	Fettig, Carl A.	Detroit
Dibble, Harry F.	Detroit	Field, G. S.	Detroit
Dickman, Harry M.	M	Finch, Alvis D.	Detroit
Dickson, B. R.	Detroit	Fine, Edward	Detroit
Diebel, Nelson W.	Detroit	Fischer, Frederick J.	M
Diebel, William H.	Detroit	Fischer, Willard Earl	M
Dietzel, H. O.	Detroit	Fisher, Edward F.	Dearborn
Dill, Hugh L.	Detroit	Fisher, George S.	M
Dill, J. Lewis	Detroit	Fisher, O. O.	Detroit
DiLoreto, Panfilo Camillo	M	Fisher, R. L.	Detroit
Dittmer, Edwin	Detroit	Fitzgerald, E. W.	M
Dixon, Fred W.	M	Fitzgerald, James M.	M
Dixon, Ray S.	Detroit	Flaherty, H. J.	Detroit
Dodds, John C.	Detroit	Flaherty, N. W.	M
Dodenhoff, C. F.	Detroit	Flaherty, S. A.	Detroit
Doerr, Louis E., Jr.	M	Fleming, L. N.	Detroit
Dolega, Stanley F.	M	Flora, William R.	M
Domzalski, C. A.	Detroit	Flower, J. A.	Detroit
Donald, Douglas	M	Fogt, Herbert E.	Detroit
Donald, William M.	Detroit	Fogt, Robert G.	Detroit
Donovan, Daniel R., Jr.	Detroit	Foley, Hugh S.	Dearborn
Donovan, John D.	Detroit	Font, Anthony J.	Detroit
Dorsey, John M.	Detroit	Foote, James A.	Lincoln Park
Doty, Chester A.	Detroit	Ford, F. A.	Detroit
Doub, Howard P.	Detroit	Ford, George A.	Detroit
Douglas, Bruce H.	Detroit	Ford, Sylvester	M
Douglas, Clair L.	M	Ford, Walter D.	Detroit
Dovitz, Benjamin W.	Detroit	Fordell, F. S.	Detroit
Dow, Roy E.	Detroit	Forrester, Alex V.	Detroit
Dowling, H. E.	Detroit	Forsythe, John R.	M
Dowling, Pearl Christie	Detroit	Foster, E. Bruce	M

ROSTER MSMS

Gratzek, Frank R. E.	Detroit	Hileman, Lee	Ecorse	Johnston, William E.	Detroit
Gravelle, Lawrence J.	Detroit	Hillenbrand, Alfred E.	M	Johnstone, B. I.	Detroit
Green, Ellis R.	Detroit	Hilton, William E.	Detroit	Joinville, E. V.	Detroit
Green, Lewis	Detroit	Hinko, Edward N.	M	Jones, Arthur J.	Detroit
Green, Louis M.	M	Hipp, William	Detroit	Jones, Adrian R.	Detroit
Green, Simpson W.	Detroit	Hirschfeld, John W.	Detroit	Jones, H. C.	M
Green, Sydney H.	M	Hirschman, L. J.	Detroit	Jones, L. Faunt.	Detroit
Greenberg, Julius J.	M	Hochman, Morton M.	Detroit	Jones, Roy D.	Detroit
Greenberg, Morris Z.	M	Hodges, Roy W.	Detroit	Jonikaitis, Joseph J.	Detroit
Greene, John B.	Detroit	Hodgkinson, C. P.	M	Joyce, Stanley J.	M
Greenidge, Robert	Detroit	Hodoski, Frank J.	Detroit	Judd, C. Hollister	Detroit
Greenlee, William Tate	Detroit	Hoenig, Andrew L.	Detroit	Juliard, Benjamin	M
Greiner, Bert A.	Detroit	Hoffman, E. S.	Detroit	Jurow, Harry N.	Detroit
Grekin, Joseph	Detroit	Hoffman, Henry A.	M	Kahn, William W.	Detroit
Grekin, Samuel L.	Detroit	Hoffman, Martin H.	Detroit	Kallet, Herbert I.	Detroit
Griffith, Arthur J.	Detroit	Holcomb, August A.	Northville	Kallman, David	Detroit
Grimaldi, G. J.	M	Hollander, A. J.	Detroit	Kallman, Leo	Detroit
Grob, Otto	Detroit	Hollis, Henry B.	Detroit	Kallman, R. Robert	M
Gronow, A. A.	Detroit	Holman, Herbert H.	M	Kaminski, L. R.	Detroit
Grossman, Sol	M	Holmes, A. W.	Detroit	Kaminski, Zeno L.	Detroit
Gruber, T. K.	Eloise	Holt, Henry T.	Detroit	Kamperman, George A.	Detroit
Gruhzit, Oswald M.	Grosse Pte. Shores	Holstein, A. P.	M	Kanter, Herman	M
Guimaraes, A. S.	Dearborn	Honhart, Fred L.	Detroit	Kapetansky, A. J.	Detroit
Gurdjian, E. S.	Detroit	Honor, William H.	Wyandotte	Kapetansky, N. J.	Detroit
Gutow, Benjamin R.	M	Hoobler, B. Raymond	Detroit	Kaplita, Walter A.	M
Hale, Arthur S.	Detroit	Hoover, Donald H.	M	Karr, Herbert S.	Detroit
Hall, Arche C.	Detroit	Hookey, J. A.	Detroit	Kasaback, V. Y.	Detroit
Hall, E. Walter	Detroit	Hooper, Norman L.	Detroit	Kasper, Joseph A.	Detroit
Hall, James A. J.	Detroit	Hoopes, Benjamin F.	M	Kass, J. B.	Detroit
Hall, Ralph E.	Detroit	Hoops, George B.	Detroit	Kates, Simon C.	Detroit
Hall, Robert J.	Detroit	Hopkins, J. E.	Detroit	Katzman, I. S.	Detroit
Haluska, Joseph A.	Detroit	Horan, Thomas	M	Kaufman, William	M
H'Amada, Norman K.	Detroit	Horny, Hugo	M	Kaump, Donald H.	Detroit
Hamburger, A. C.	M	Horton, Reece H.	Detroit	Kay, Edward W.	Detroit
Hamilton, Norman C.	Detroit	Horvath, Louis O.	Detroit	Kay, Harry H.	M
Hamilton, Stewart	Detroit	Horwitz, John B.	M	Kazdan, Louis	M
Hamilton, William	Detroit	Host, Lawrence N.	Detroit	Kazdan, Morris A.	M
Hamilton, William F.	Detroit	Hotchkiss, Loris M.	Farmington	Keane, William E.	Detroit
Hammer, Charles A.	Detroit	Howard, Austin Z.	Detroit	Kearns, Hubert J.	Detroit
Hammer, Edwin J.	Detroit	Howard, Philip J.	Detroit	Keemer, Edgar B.	Detroit
Hammer, Howard J.	M	Howell, Bert F.	Detroit	Keene, Clifford H.	M
Hammond, A. E.	Detroit	Howes, Willard Boyden	Detroit	Kehoe, Henry J.	East Detroit
Hammond, James L.	Inkster	Hromadko, Louis	Detroit	Kelly, Edward W.	Detroit
Hand, Fordus V.	Detroit	Hubbard, John P.	Detroit	Kelly, Frank A.	Detroit
Hanna, Carl	M	Hubbard, Ralph G.	Detroit	Kemler, W. J.	Ecorse
Hanna, E. Howard	Detroit	Hudson, A. Willis	Detroit	Kennedy, James M.	Detroit
Hanna, Samuel C.	Detroit	Hudson, J. Stewart	Grosse Pointe	Kennedy, Charles S.	Detroit
Hansen, Frederick E.	Detroit	Hudson, William A.	Detroit	Kennedy, L. F.	Detroit
Hanser, Joshua	Detroit	Huegli, Wilfred A.	M	Kennedy, Robert B.	Detroit
Hanson, Frederick N.	M	Huff, Reginald G.	Wayne	Kenning, John C.	Detroit
Hareluk, E. W.	Detroit	Hughes, Albertie A.	Detroit	Kenyon, Fanny H.	Detroit
Hardstaff, R. John	Detroit	Hughes, Ray W.	Detroit	Kern, W. H.	Garden City
Hardy, George C.	Detroit	Hull, L. W.	Detroit	Kernkamp, Ralph	Detroit
Harkins, Henry R.	Detroit	Hunt, T. H.	Detroit	Kernick, Melvin O.	M
Harley, Louis M.	Detroit	Hunter, Basil H.	Detroit	Kersten, Armand G.	Detroit
Harm, W. B.	Detroit	Hunter, C. M.	Detroit	Kersten, Werner	Detroit
Harper, Jesse T.	M	Hunter, Elmer N.	Detroit	Keshishian, Sarkis K.	Detroit
Harrell, Voss	Detroit	Husband, Charles W.	Detroit	Keyes, Eugene Charles	M
Harris, Albert E.	Detroit	Hyatt, Jarvis M.	M	Keyes, John W.	M
Harris, Harold H.	M	Iacobell, Peter H.	M	Kibzey, Ambrose T.	Detroit
Harrison, Hugh	Detroit	Ignatius, A. A.	Detroit	Kidner, Frederick C.	Detroit
Harrison, Wesley	Detroit	Ihle, Lyman E.	M	Kimball, David C.	M
Hart, Charles E.	M	Inslay, Stanley W.	Detroit	Kimberlin, Kenneth K.	M
Hart, J. Clarence	M	Irwin, W. A.	Detroit	King, Edward D.	Detroit
Hartgraves, Hallie	Detroit	Israel, Barney B.	M	King, Melbourne J.	M
Hartman, F. W.	Detroit	Israel, J. G.	Detroit	Kingswood, Roy C.	Detroit
Hartmann, W. B.	Detroit	Isbey, Edward K.	Detroit	Kirchner, Augustus	Detroit
Hartzell, John B.	M	Ivkovich, Peter	M	Kirk, J. G.	Detroit
Hasley, Clyde K.	Detroit	Jacobson, Samuel D.	Eloise	Kirschbaum, Harry M.	M
Hasley, Daniel E.	Detroit	Jacoby, Myron D.	Detroit	Klebba, Paul	Detroit
Hastings, Orville J.	Detroit	Jaeger, Grove A.	Detroit	Klein, William	Detroit
Hause, Glen E.	M	Jaeger, Julius P.	Detroit	Kleinman, S.	Detroit
Hauser, I. Jerome	M	Jaekel, C. N.	Detroit	Kliger, David	Detroit
Havers, Howard	Detroit	Jaffar, Donald J.	Detroit	Kline, Starr L.	Detroit
Hawken, William C.	Detroit	Jaffe, J. L.	Detroit	Kloeppel, C. S.	Detroit
Hawkins, James W.	Detroit	Jaffe, Jacob	Detroit	Klosowski, Joseph	Detroit
Hayes, Joseph D.	Detroit	Jaffe, Louis	M	Klote, M. D.	Detroit
Heath, Leonard P.	M	James, L. Mae	Detroit	Knaggs, Charles W.	Grosse Pointe
Heath, Parker	Detroit	Jahsman, William E.	Detroit	Knaggs, Earl J.	M
Heavner, L. E.	M	Jamieson, Robert C.	Detroit	Knapp, Byron S.	M
Hedges, Frank W.	Detroit	Jarre, Hans A.	Detroit	Knapp, Floyd	Detroit
Hedrick, Donald W.	Detroit	Jarzynka, Frank J.	Dearborn	Knobloch, Edmund J.	Detroit
Heenan, T. H.	Detroit	Jasion, Lawrence J.	M	Knoch, Hubert S.	M
Heideman, Louis	M	Jend, William J.	Detroit	Knox, Ross M.	Ecorse
Heldt, Thomas J.	Detroit	Jenkins, E. A.	M	Koebel, R. H.	Detroit
Heller, Carl George	Detroit	Jenne, Byron H.	Detroit	Koerher, Edward J.	Detroit
Hendelman, Manuel H.	Detroit	Jennings, Alpheus F.	Detroit	Koessler, George L.	Detroit
Henderson, A. B.	M	Jennings, Robert M.	M	Kohn, A. Max.	M
Henderson, Harold	Detroit	Jentgen, Charles J.	Detroit	Kohn, M. E.	Detroit
Henderson, J. L.	Detroit	Jentgen, L. G.	Detroit	Kokowicz, Raymond J.	M
Henderson, Leslie T.	Detroit	Jewell, F. C.	Detroit	Kolas, W. B.	Detroit
Henderson, William E.	Detroit	Jocz, Marion W.	Detroit	Kopel, Joseph O.	Detroit
Henderson, William W.	M	Jodar, E. O.	Detroit	Korby, George J.	M
Henig, Fred	M	John, Hubert R.	Detroit	Kosanovic, Frederick	M
Henrich, L. E.	Detroit	Johnson, Homer L.	Detroit	Koss, Frank R.	M
Herkimer, Dan R.	M	Johnson, Ralph A.	Detroit	Kossydaya, Adam W.	M
Herold, Rose E.	Detroit	Johnson, R. M.	Detroit	Kovach, Emery P.	Detroit
Herschelmann, Roy F.	M	Johnson, V. P.	Detroit	Kovan, Dennis D.	M
Hershey, Lynn N.	Detroit	Johnson, Vincent C.	Detroit	Koven, Abraham	Detroit
Hewitt, Leland V.	Detroit	Johnson, W. H. M.	Detroit	Kowalski, Valentine L.	M
Hewitt, Robert S.	M	Johnston, Charles G.	Detroit	Kozlinski, Anthony E.	M
Heyner, Stanley A.	Detroit	Johnston, Everett V.	Detroit	Kraft, Raymond B.	Detroit
Hickey, Joseph	Detroit	Johnston, J. A.	Detroit	Kraft, Ruth M.	Detroit
Higbee, Arthur L.	Detroit	Johnston, John L.	Detroit	Krass, Edward W.	M

ROSTER MSMS

Kraus, John J.	Detroit	Long, John J.	M	McDonald, Allan W.	Detroit
Krebs, William T.	Detroit	Loranger, C. B.	M	McDonald, Angus L.	Detroit
Kretschmar, C. A.	Detroit	Loranger, Guy L.	M	McDonald, George O.	Detroit
Krieg, Earl G.	Detroit	Lorber, Joseph H.	M	McDonald, Peter W.	M
Krieger, Harley L.	Detroit	Lord, Herman M.	M	McDougall, Bernard W.	Detroit
Kreinbring, George E.	Detroit	Lorentzen, Edwin H.	M	McGarvah, A. W.	Detroit
Kritchman, M. J.	M	Lovas, W. S.	M	McGarvah, Joseph A.	M
Kroha, Lawrence	Detroit	Love, W. Thomas	M	McGavran, Harry G.	Detroit
Krohn, Albert H.	Detroit	Lovering, Wm. J.	M	McGinnis, Daniel H.	Detroit
Krynicki, Francis X.	Detroit	Lowrie, G. B.	M	McGlaughlin, Nicholas D.	M
Kubanek, Joseph L.	Eloise	Lowrie, Wm. L., Jr.	M	McGough, Joseph M.	M
Kuhn, Albert Arthur	M	Lowry, George L.	M	McGraw, Arthur B.	M
Kuhn, Richard F.	M	Luce, Henry A.	M	McQuiggan, Paul	M
Kulaski, Chester H.	Detroit	Lum, Thomas Kion	M	McGuire, M. Ruth	Detroit
Kullman, Harold J.	M	Lutz, Earl F.	M	McIntosh, W. V.	Detroit
Kurcz, J. A.	M	Lynch, E. J.	M	McKean, G. Thomas	M
Kurtz, I. J.	M	Lynn, David H.	M	McKean, Richard M.	M
Kwasiborski, S. A.	Wyandotte	Lynn, Harvey D.	M	McKenna, Chas. J.	M
Laberge, James M.	M	Mabee, Frank P.	M	McKinnon, John D.	Detroit
LaCore, Ivan	M	Mabley, J. Donald	M	McLane, Harriett E.	Detroit
Ladd, Graham B.	Detroit	MacArthur, Robert A.	M	McLean, Don W.	M
La Ferte, Alfred D.	Detroit	MacCracken, Frances L.	M	McLean, Harold G.	Detroit
Laird, Robert	Detroit	MacFarlane, Howard W.	M	McPherson, R. J.	Detroit
Lakoff, Charles	Detroit	MacGregor, W. W.	M	McQuiggan, Mark B.	Detroit
Lam, Conrad R.	Detroit	Mack, Harold C.	M	McRae, Donald H.	Detroit
Lamberson, Frank A.	Detroit	MacKenzie, Earle D.	M	Mead, John	Detroit
La Marche, N. O.	Detroit	MacKenzie, Frank M.	M	Meader, F. M.	Detroit
Lammy, James V.	Royal Oak	MacKenzie, John W.	M	Meek, Stuart F.	Detroit
Lampman, H. H.	Detroit	Mackersie, W. G.	M	Meinecke, Helmuth A.	Detroit
Landers, M. B., Sr.	Detroit	MacMillan, Francis B.	M	Mellen, Hyman S.	Detroit
Landers, M. B., Jr.	Dearborn	MacMillan, James M.	M	Menagh, Frank R.	Detroit
Lang, Leonard W.	Detroit	MacMullen, Frank B.	M	Mendelssohn, R. J.	Detroit
Lange, Anthony H.	Detroit	MacQueen, Malcolm D.	M	Merkel, Chas. C.	Grosse Pointe
Lange, William A.	M	Maczewski, John E.	M	Merrill, Wm. C.	Detroit
Langohr, John L.	Detroit	Magnell, Ralph C.	M	Merritt, Earl G.	Detroit
Laning, George M.	Detroit	Maguire, Clarence E.	M	Metzger, Harry C.	Detroit
Lansky, Mandell	M	Mahlatjie, Nathaniel M.	M	Meyer, Ruben	Detroit
Lapham, Fred E.	M	Mahoney, Hugh M.	M	Meyers, M. P.	M
Larsson, Bror H.	Detroit	Maiabauer, F. P.	M	Miley, H. H.	Detroit
Lash, Michael William	Detroit	Maire, E. D.	M	Miller, Daniel H.	Detroit
Lasley, James William	Detroit	Mair, Harold U.	M	Miller, Harry A.	M
Lassaline, S. J.	Detroit	Malachowski, B. T.	M	Miller, Hazen L.	Detroit
Lathrop, Philip L.	Detroit	Malik, Edward A.	M	Miller, Karl	M
Laub, Stanley V.	M	Malik, Nur M.	M	Miller, Maurice P.	Trenton
Lauppe, Edward H.	Detroit	Malina, Stephen	M	Miller, Myron H.	Detroit
Lauppe, F. A.	M	Malone, Herbert	M	Miller, T. H.	M
Law, John H.	Detroit	Maloney, John A.	M	Miller, Wm. Ernest	Detroit
Leach, David	M	Mancuso, Vincent	M	Mills, Clinton C.	M
Lawrence, William C.	Detroit	Mandiberg, Jack N.	M	Mills, Georgia V.	Detroit
Lazar, Morton R.	M	Manning, Morey H.	M	Mintz, Edward I.	Detroit
Leacock, Robert C.	Detroit	Manting, J.	M	Miral, Solomon P.	Detroit
Leader, L. R.	Detroit	Maples, Douglas E.	M	Miskelevich, Sophie	Detroit
Leaver, L. Ross	Detroit	Marcotte, Oliver	M	Mitchell, C. Leslie	Detroit
Leckie, George C.	Detroit	Marcus, Daniel B.	M	Mitchell, Gertrude F.	Detroit
Ledwidge, Patrick L.	Detroit	Marinus, Carleton J.	M	Mitchell, W. Bede	M
Lee, Harry E.	Detroit	Marion, Donald F.	M	Moehlig, Robert C.	Detroit
LeGallee, George M.	M	Mark, Jerome	M	Moisides, V. P.	Detroit
Lehman, William L.	M	Markoe, Rupert C. L.	M	Moll, Clarence D.	Detroit
Leibinger, H. R.	Detroit	Marks, Ben	M	Molner, Joseph G.	Detroit
Leipsitz, Louis S.	M	Marks, Morris	M	Moloney, J. Clark	M
Leiser, Rudolf	Eloise	Marsden, Thomas B.	M	Mond, Edward	Detroit
Leithauser, D. J.	Detroit	Marshall, James R.	M	Monfort, Willard	Detroit
Leland, Sol	M	Martin, Edward G.	M	Montgomery, John C.	Detroit
Lemley, Clark	Detroit	Martin, Elbert A.	M	Montante, Jos. R.	M
Lemmon, Charles E.	M	Martin, I. Herbert	M	Moorehead, Matthew T.	Detroit
Lemmon, Clarence W.	River Rouge	Martin, J. B., Jr.	M	Morand, Louis J.	Detroit
Lentine, James J.	M	Martin, L. R.	M	Morgan, Donald Nye	Detroit
Lenz, Willard R.	Detroit	Martin, H. M.	M	Moriarty, George	Detroit
Lepley, Fred O.	Detroit	Martin, Wm. C.	M	Morin, John B.	Detroit
Lescohier, Alex W.	Grosse Pointe	Martinez, P. O.	M	Moritz, H. C.	Detroit
L'Esperance, Simon P.	Detroit	Martner, Edgar	M	Morley, Harold V.	M
Leszynski, J. S.	Detroit	Marwil, T. B.	M	Morley, James A.	Detroit
Leucutia, Traian	Detroit	Mason, Percy W.	M	Morris, Harold L.	Detroit
Levant, Arthur B.	M	Massengile, Cleave	M	Morrison, Marjorie G. E.	Detroit
Levin, David M.	M	Mateer, John G.	M	Morse, Plinn F.	Detroit
Levin, Michael M.	M	Mathes, Charles J.	M	Morton, David G.	M
Levine, Sidney S.	M	Matthews, Wallace R.	M	Morton, J. B.	Detroit
Levitt, Nathan	Detroit	Maun, Mark E.	M	Mosee, W. Jones	Detroit
Levy, Marvin B.	Detroit	May, Earl W.	M	Mosen, Max M.	Detroit
Lewin, Harry	Detroit	May, Frederick T., Jr.	M	Moss, E. B.	Detroit
Lewis, Charles T.	Detroit	Mayer, E. V.	M	Moss, Nathan H.	Detroit
Lewis, David H.	Detroit	Mayer, Willard D.	M	Mott, Carlin P.	Detroit
Lewis, L. A.	Detroit	Mayme, C. H.	M	Muellenhagen, Walter J.	Detroit
Lewis, J. Hugh	M	McAlonian, Wm. T.	M	Munson, F. T.	Detroit
Lewis, Wilfred John	M	McAlpine, Gordon S.	M	Muntyan, Andrew	Detroit
Libbrecht, Robert V.	Detroit	McClellan, G. L.	M	Murphy, D. J.	M
Lichter, M. L.	Detroit	McClellan, Robert J.	M	Murphy, Frank J.	M
Lichtwardt, Hartman A.	Detroit	McClendon, James J.	M	Murphy, John M.	M
Lieberman, B. L.	Detroit	McClintock, J. J.	M	Murphy, Scipio G.	Detroit
Liddicoat, A. G.	Detroit	McClure, Robert W.	M	Murphy, W. M.	Detroit
Lighthbody, James J.	Detroit	McClure, Roy D.	M	Murray, George M.	Detroit
Lignell, Rudolph	Detroit	McColl, Charles W.	M	Murray, William A.	Detroit
Lilly, Charles J.	Detroit	McColl, Clarke M.	M	Muske, Paul H.	M
Lilly, Vernon S.	Detroit	McColl, Kenneth M.	M	Musser, Fred C.	Detroit
Linton, James R.	Eloise	McCollum, E. B.	M	Myers, Geo. P.	Detroit
Lipinski, Stanley L.	Detroit	McCord, Carey P.	M	Myers, Gordon B.	Detroit
Lippold, Ezra	Detroit	McCormick, Colin C.	M	Nagel, Oscar	M
Lippold, Paul H.	Detroit	McCormick, Crawford W.	M	Nagle, John W.	Detroit
Lipschutz, Louis S.	Detroit	McCormick, Frank	M	Naud, Henry J.	Detroit
Livingston, George D.	M	McCullough, Lester E.	M	Nawotka, E. E.	Detroit
Lockwood, Bruce C.	Detroit			Naylor, A. E.	Detroit
Lofstrom, James E.	M			Naylor, Arthur H.	Detroit
Long, Earle C.	Detroit			Neeb, Walter G.	M

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Nelson, Victor E.	.M	Price, A. H.	Detroit	Russell, John C.	Detroit
Nelson, Victor J.	Detroit	Price, Alvin E.	.M	Ryan, Charles F.	Detroit
Newmann, Arthur J.	Detroit	Proctor, Bruce	Detroit	Ryan, W. D.	Detroit
Newbarr, Arthur A.	Detroit	Proud, Robert H.	Detroit	Rydzewski, Jos. B.	Detroit
Newcomer, Sheldon R.	.M	Ptolemy, H. H.	Detroit	Ryerson, Frank L.	Detroit
Newman, Max Karl.	Detroit	Pugliesi, Benedetto	Detroit	Sachs, Herman K.	.M
Nielsen, Aage E.	.M	Purcell, Frank H.	Detroit	Sack, A. G.	.M
Nichamin, Samuel J.	.M	Putra, A. M.	.M	Sadowski, Roman	Detroit
Nickels, Albert W.	.M	Pyle, Wynand	Detroit	Sage, Edward O.	Detroit
Nickerson, Dean	.M	Quigley, Wm.	Detroit	Sager, E. L.	Detroit
Nigro, Norman D.	.M	Rahm, Lambert P.	.M	St. Louis, R. J.	Detroit
Nill, John B.	Detroit	Raiford, Frank P.	Detroit	Salchow, Paul T.	Detroit
Nill, Wm. F.	Detroit	Rand, Morris	Detroit	Salowich, John N.	Detroit
Noer, Rudolf J.	.M	Rao, John O.	Detroit	Saltzstein, Harry C.	Detroit
Nolting, Wilfred S.	.M	Raskin, John	Detroit	Sander, I. W.	Detroit
Norconk, A. A.	.M	Rastello, Peter B.	Detroit	Sanders, Alex W.	Detroit
Norris, Edgar H.	Detroit	Ratigan, C. S.	Detroit	Sanderson, Alvord R.	Detroit
Northrop, Arthur K.	Detroit	Raynor, Harold F.	Detroit	Sanderson, James H.	Detroit
Norton, A. B.	Detroit	Reed, H. Walter	Detroit	Sanderson, Joseph L.	Detroit
Norton, Chas. S.	Detroit	Reed, Ivor E.	Detroit	Sanderson, Suzanne	Detroit
Novy, R. L.	Detroit	Rees, Howard C.	Detroit	Sandler, Nathaniel	.M
Nowicki, Joseph A.	Detroit	Reid, Wesley G.	.M	Sands, G. E.	Detroit
O'Brien, E. J.	Detroit	Reiff, Morris V.	.M	Sandweiss, D. J.	Detroit
O'Brien, G. M.	Detroit	Reinbolt, Chas. A.	Detroit	Sanford, Hawley S.	.M
O'Donnell, David H.	Detroit	Reinsh, Ernest R.	.M	Sargent, William R.	Detroit
O'Donnell, Dayton H.	.M	Reisman, Nathan J.	Detroit	Sauk, John J.	.M
Ohmart, Galen B.	Detroit	Rekshaw, W. R.	Detroit	Sauter, Simon H.	Detroit
O'Hora, James T.	Detroit	Renaud, G. L.	Detroit	Savignac, Eugene M.	Detroit
Olenikoff, Alex	.M	Rennell, Leo P.	Detroit	Sawyer, Harold F.	.M
Olechowski, Leo W.	.M	Renz, Russell H.	Detroit	Scarney, Herman D.	.M
Olmsted, William R.	Detroit	Repp, Wm. A.	Detroit	Schaeffer, Robert L.	.M
Olney, H. E.	Detroit	Reske, Alven	.M	Schaeffer, Martin	Detroit
Oman, Cyrus F.	Detroit	Renvo, Wm. S.	Detroit	Schendien, A. J.	Melvindale
Oppenheim, J. M.	.M	Rexford, Walton K.	Detroit	Schiller, A. E.	Detroit
Oppenheim, Milton M.	Highland Park	Reye, H. A.	Detroit	Schillinger, Harold K.	Dearborn
Organ, Fred W.	Detroit	Reyner, C. E.	Detroit	Schinagel, Geza	Detroit
Ormond, John K.	Detroit	Reynolds, Lawrence	Detroit	Schrack, Ray	Detroit
Orecklin, L.	Detroit	Reynolds, R. P.	Detroit	Schlacht, George F.	Romulus
O'Rourke, Paul V.	Detroit	Rezanka, Harold J.	Detroit	Schlafer, Nathan H.	Detroit
O'Rourke, Randall M.	Detroit	Rhoades, F. P.	Detroit	Schlemer, John H.	Detroit
Osius, Eugene A.	.M	Rice, Clair M., Jr.	.M	Schmidt, Harry E.	.M
Ott, Harold A.	.M	Rice, Harold B.	Detroit	Schmidt, J. Robert	.M
Ottaway, John P.	.M	Rice, Meshel	Detroit	Schmidt, Milton R.	.M
Ottrock, Anton	Detroit	Richards, R. Milton	Detroit	Schnier, Burton L.	Detroit
Owen, Clarence I.	.M	Richardson, Allan L.	Detroit	Schmitt, Norman L.	Detroit
Owen, Samuel H. G.	Detroit	Richardson, Robert P.	Detroit	Schneck, R. J.	Detroit
Palmer, Alice	Detroit	Rick, Paul J.	Detroit	Schneider, Curt P.	.M
Palmer, Hayden	Detroit	Ridge, Ralph W.	Detroit	Schoenfeld, Gilbert D.	Detroit
Palmer, R. Johnston	Detroit	Riedel, Ed. R.	Detroit	Schooten, Sarah S.	Detroit
Palmerlee, George H.	Detroit	Rieckhoff, George G.	Detroit	Schreiber, Frederick	Detroit
Pangburn, L. E.	Detroit	Rieger, John B.	Detroit	Schroeder, Carlisle F.	.M
Panzner, Edward J.	Detroit	Rieger, Mary H.	Detroit	Schultz, Carl H.	Detroit
Parker, Albert R.	Detroit	Riseborough, E. C.	Detroit	Schultz, Ernest C.	Detroit
Parker, Benjamin R.	.M	Rizzo, Frank	Detroit	Schultz, Robert F.	.M
Parker, Walter R.	Detroit	Robb, Edw. L.	Detroit	Schwartz, Ben	Detroit
Parr, R. W.	Detroit	Robb, Herbert F.	Detroit	Schwartz, H. Allen	Detroit
Parsons, John P.	Grosse Pointe Park	Robb, J. M.	Detroit	Schwartz, Louis A.	.M
Pasternacki, Norbert T.	Detroit	Robbins, Edward R.	Detroit	Schwartz, Oscar D.	.M
Paterson, Walter G.	Detroit	Roberts, Arthur J.	Detroit	Schwartzberg, Joseph A.	.M
Patton Henry S.	Detroit	Roberts, Frederick J.	Detroit	Schweigert, C. F.	.M
Pawlowski, Jerome	Detroit	Robertson, Stanley B.	Detroit	Sciarrino, Stanley V.	Detroit
Paysner, Harry A.	Detroit	Robertson, Tom H.	Detroit	Scott, J. W.	Detroit
Peabody, Chas. Wm.	Detroit	Robillard, Henry	Detroit	Scott, R. J.	.M
Peacock, Lee W.	Highland Park	Robins, Samuel C.	Detroit	Scott, William J.	Grosse Pointe Farms
Pearse, Harry A.	Detroit	Robinson, George W.	Detroit	Scruton, Foster D.	Detroit
Peiggs, George F.	.M	Robinson, Harold A.	.M	Seabury, Frank P.	Detroit
Peirce, Howard W.	Detroit	Robinson, R. G.	Detroit	Second, Eugene W.	Detroit
Penberthy, G. C.	.M	Rogers, A. Z.	Detroit	Seeley, James B.	Dearborn
Pensler, Meyer	.M	Rogers, James D.	Detroit	Seeley, Ward F.	Detroit
Pequegnot, Chas. F.	Detroit	Rogin, James R.	Detroit	Segar, Lawrence F.	Detroit
Perdue, Grace M.	Detroit	Rogoff, A. S.	.M	Seibert, Alvin H.	Grosse Pointe Park
Perkin, Frank S.	.M	Rohde, Paul C.	Detroit	Selby, C. D.	Detroit
Perkins, Ralph A.	Detroit	Rom, Jack	.M	Seliady, Joseph E.	.M
Perlis, H. L.	Detroit	Roman, Stanley J.	.M	Sellers, Graham	Detroit
Perry, Alvin LaForge	.M	Roney, Eugene H.	.M	Selling, Lowell	Detroit
Peterman, Earl A.	Detroit	Root, Chas. T.	.M	Selman, J. H.	Detroit
Petix, Samuel C.	Detroit	Rosbolt, Oscar P.	Detroit	Seymour, William J.	Detroit
Pevin, Pauline	Detroit	Rose, Bernard	Detroit	Shafarman, Eugene	Detroit
Pfeiffer, Rudolph L.	Detroit	Rosefield, John L.	Detroit	Shaffer, Carl F.	Detroit
Phillips, Fred W.	Detroit	Rosen, Robert	Detroit	Shaffer, Joseph H.	.M
Pickard, Orland W.	Detroit	Rosenberger, Homer	.M	Shaffer, Loren W.	Detroit
Pierce, Frank L.	Detroit	Rosenman, J. D.	Detroit	Shafter, Royce R.	Detroit
Pierson, Max J.	Detroit	Rosenthal, Louis H.	.M	Shankwiler, Reed A.	Detroit
Pincard, Karl G.	Detroit	Rosenthal, M. J.	Detroit	Shapiro, Reuben I.	Detroit
Pink, Rose M.	Detroit	Rosenzweig, Saul	Detroit	Sharp, Helen C.	Detroit
Pinney, Lyman J.	Detroit	Ross, D. G.	Detroit	Sharrer, Charles H.	Detroit
Pino, Ralph H.	Detroit	Ross, Ben C.	.M	Shaw, Robert G.	Detroit
Piper, Clark C.	Detroit	Ross, Samuel H.	.M	Shawhan, Harold K.	Detroit
Piper, Ralph R.	Detroit	Roth, Edward T.	.M	Shebasta, Bessey Heald	Detroit
Plaggemeyer, H. W.	Detroit	Roth, Theodore I.	.M	Shebasta, Emil	.M
Pliskow, Harold	.M	Rotarius, E. M.	Detroit	Sheldon, John A.	Detroit
Podezwa, John W.	.M	Rothbart, H. B.	Detroit	Shelton, C. F.	.M
Pollack, John J.	Detroit	Rothman, Emil D.	Detroit	Sheppard, Emma L. W.	Detroit
Poole, Marsh W.	.M	Rothstein, Hyman	.M	Sheppard, William B.	.M
Poos, Edgar	Detroit	Rottenberg, Leon	.M	Sheridan, Charles R.	Detroit
Porretta, Anthony C.	Detroit	Rowda, Michael S.	Detroit	Sherman, B. B.	Detroit
Porretta, F. S.	Detroit	Rowell, Robert C.	Detroit	Sherman, William L.	Detroit
Porter, Howard J.	Romulus	Rowell, Wilfred J.	.M	Sherrin, Edgar R.	.M
Portnoy, Harry	Detroit	Rubright, Leroy W.	.M	Sherwood, DeWitt L.	Detroit
Potts, E. A.	Detroit	Rucker, Julian J.	Detroit	Shewchuk, Alexander P.	.M
Posner, Irving	Detroit	Rueger, Milton J.	.M	Shields, William L.	Detroit
Potter, Marcia	Detroit	Rueger, Ralph C.	Detroit	Shifrin, Peter G.	.M
Pratt, Jean P.	Detroit				

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Shotwell, Carlos W.....	Detroit
Shulak, Irving B.....	M
Shurly, Burt R.....	Detroit
Siddall, Roger S.....	Detroit
Sieber, Edward H.....	Dearborn
Siefert, John L.....	M
Siefert, William A.....	Detroit
Siegel, Henry	M
Sill, Henry W.....	Detroit
Silvarman, I. Z.....	Detroit
Silver, Israel W.....	Detroit
Silverman, M. M.....	Detroit
Simon, Emil R.....	Detroit
Simons, Edward J.....	M
Simpson, C. E.....	Detroit
Simpson, H. Lee.....	Detroit
Sippola, George W.....	Detroit
Sisson, John M.....	Detroit
Skinner, Edward F.....	Detroit
Skinner, W. Clare.....	Detroit
Skolnick, Max H.....	M
Skrzynski, Stephen S.....	Detroit
Skully, E. J.....	Detroit
Skully, G. A.....	M
Sladen, Frank J.....	Detroit
Slate, Raymond N.....	Detroit
Slaughter, Fred M.....	Detroit
Slaugenhaft, J. G.....	Detroit
Slazinski, Leo W.....	Detroit
Slevin, John G.....	M
Slipson, Edith G.....	Detroit
Sliwin, Edward P.....	M
Small, Henry	M
Smeck, Arthur R.....	Detroit
Smeltzer, Merrill	M
Smith, F. Janney.....	Detroit
Smith, Fred R.....	M
Smith, Gerrit Calvin.....	Detroit
Smith, Henry L.....	Detroit
Smith, J. Allen.....	Detroit
Smith, James A.....	Detroit
Smith, J. Campbell.....	Detroit
Smyth, Charley J.....	Eloise
Snedeker, Bernard C.....	M
Snow, L. W.....	Northville
Snyder, Arthur M.....	Detroit
Sobin, David J.....	Detroit
Socall, Charles J.....	M
Sokolov, Raymond A.....	Detroit
Somers, Donald C.....	M
Sonda, Lewis P.....	Detroit
Sorock, Milton L.....	M
Souda, Andrew	Wyandotte
Spademan, Loren C.....	Detroit
Spalding, Edward D.....	M
Sparks, J. H.....	Detroit
Sparling, Harold I.....	M
Sparling, Irene L.....	Northville
Speck, Carlos C.....	Ecorse
Spector, Maurice J.....	M
Spencer, Frank	Detroit
Spero, Gerald D.....	Detroit
Sperry, Frederick L.....	Detroit
Spiro, Adolph	M
Springborn, B. R.....	Detroit
Sprunk, Carl	M
Sprunk, John P.....	Detroit
Spurrer, Ethelbert	Detroit
Squires, W. H.....	Eloise
Stafford, Frank W. J.....	Detroit
Stageman, John C.....	M
Stalker, Hugh	Grosse Pointe
Stamell, Meyer	M
Stamos, Harry F.....	M
Stanton, James M.....	Detroit
Stapleton, William J., Jr.....	Detroit
Staars, Thomas C.....	Detroit
Stefani, E. L.....	Detroit
Stefani, Raymond T.....	M
Steffes, Everett M.....	M
Stein, Albert H.....	M
Stein, Emory	Detroit
Stein, James R.....	Ferndale
Stein, Saul C.....	M
Steinbach, Henry B.....	Detroit
Steinberger, Eugene	Detroit
Steiner, Louis J.....	Detroit
Steiner, Max	M
Steinhardt, Milton J.....	M
Stellhorn, Chester E.....	Detroit
Stellhorn, Mary Christine.....	Detroit
Sterling, Lawrence	Detroit
Sterling, Robert R.....	Detroit
Stern, Edward A.....	Detroit
Stern, Harry L.....	Detroit
Stern, Leonard H.....	Detroit
Stern, Louis D.....	Detroit
Stevens, Rollin H.....	Detroit
Stewart, Thomas O.....	Detroit
Stirling, Alex M.....	Detroit
Stobbe, Godfrey D.....	M
Stockwell, B. W.....	M
Stofer, Bert E.....	Detroit
Stokfisz, T.....	Detroit
Stoltz, Harold F.....	Detroit
Stout, Lindley H.....	Detroit
Straith, Claire L.....	Detroit
Stricker, Henry D.....	Detroit
Strickroot, Fred L.....	M
Strohschein, Don F.....	Detroit
Stubbs, C. T.....	Detroit
Stubbs, Harold W.....	Detroit
Sugar, David I.....	Detroit
Sugarman, Marcus H.....	M
Sullivan, Hugh A.....	Detroit
Summers, William S.....	Detroit
Surbis, John P.....	Detroit
Sutherland, J. M.....	Detroit
Swanson, Carl W.....	Detroit
Swanson, C. N.....	Detroit
Swartz, J. N.....	Detroit
Swift, Karl L.....	Detroit
Switzer, Bertrand C.....	Detroit
Syphax, Charles S., Jr.....	Detroit
Szappanyos, Bela T.....	Detroit
Szedja, J. C.....	M
Szilagy, Emerick D.....	Detroit
Szlachetka, V. E.....	M
Szmigiel, A. J.....	Detroit
Tamblyn, E. J.....	Detroit
Tann, H. E.....	Detroit
Tapert, Julius C.....	Detroit
Tasker, Helen	Detroit
Tatelis, Gabriel	Detroit
Taylor, Ivan B.....	M
Taylor, Nelson M.....	M
Taylor, Reu Spencer	Detroit
Tear, Malcolm J.....	M
Teitelbaum, Myer	M
Tenaglia, Thomas A.....	M
Tenerowicz, Rudolph G.....	Washington, D. C.
Test, Frederick C., II.....	Detroit
Textor, Elmer C.....	Detroit
Thomas, Alfred E.....	Detroit
Thomas, Delma F.....	Detroit
Thomas, Fred W.....	Detroit
Thompson, David L.....	Detroit
Thompson, H. E.....	Detroit
Thompson, H. O.....	M
Thompson, James B.....	Detroit
Thompson, W. A.....	Detroit
Thomson, Alexander	Detroit
Thosteson, George C.....	Detroit
Thurston, Roger G.....	M
Tichenor, E. D.....	Detroit
Tomsu, Charles L.....	Detroit
Top, F. H.....	Detroit
Torrey, H. N.....	Detroit
Townsend, Frank M.....	Detroit
Townsend, Kyle E.....	Detroit
Trask, Harry D.....	Detroit
Tregenza, W. Kenneth	Detroit
Trinity, Granville J.....	Detroit
Troester, George A.....	M
Trombley, Bryan	Detroit
Trombley, Joseph J., Jr.....	M
Troxell, Emmett C.....	Detroit
Truog, Clarence P.....	M
Truszkowski, E. G.....	M
Trythall, S. W.....	Detroit
Tufford, Norman G.....	Detroit
Tulloch, John	M
Tupper, Roy D.....	Detroit
Turbett, Claude W.....	Detroit
Turcotte, Vincent J.....	Detroit
Turkel, Henry	Detroit
Turner, Alexander L.....	Detroit
Tyson, William E. E.....	Detroit
Ujda, Chester J.....	Detroit
Ulbrich, Henry L.....	Detroit
Ulrich, Harold W.....	Detroit
Ulrich, Willis H.....	M
Uphrey, Clarence E.....	Detroit
Usher, William Kay	Detroit
Vale, C. Fremont	Detroit
VanBaalen, M. R.....	Detroit
Van Beclaeare, L. H.....	Ecorse
Van de Velde, Honore	Detroit
VanGundy, Clyde R.....	Detroit
Van Heldorf, Harry	Detroit
Van Nest, A. E.....	Detroit
Van Rhee, George	Detroit
Vardon, Edward M.....	Detroit
Vasu, V. O.....	Detroit
Vergosen, Harry E.....	M
Vincent, J. LeRoi	M
Voegelin, Adolph E.....	Detroit
Voelkner, George H.....	Detroit
Vogel, Hymen A.....	Detroit
Vokes, Milton D.....	Detroit
Von der Heide, E. C.....	Detroit
Voorheis, Wilbur J.....	Detroit
Vossler, A. E.....	Detroit
Vreeland, C. Emerson	Detroit
Waddington, Joseph E. G.....	Detroit
Wadsworth, George H.....	M
Waggoner, C. Stanley	Detroit
Waggoner, Lyle G.....	Detroit
Wainger, M. J.....	Detroit
Waldbott, George L.....	Detroit
Walker, Enos G.....	M
Walker, J. Paul	Detroit
Walker, Roger V.....	Detroit
Wallace, S. Willard	M
Walls, Arch	Detroit
Walser, Howard Carleton	Detroit
Walsh, Charles R.....	Detroit
Walsh, Francis P.....	Detroit
Walters, Albert G.....	Detroit
Waltz, Frank D. B.....	Detroit
Wander, William G.....	Detroit
Ward, W. K.....	Detroit
Warden, Horace F. W.....	Detroit
Warner, P. L.....	Detroit
Warren, Wadsworth	M
Wasserman, Lewis C.....	Detroit
Waszak, Charles J.....	Detroit
Watson, Douglas J.....	M
Watson, Harwood G.....	Detroit
Watson, J. Edwin	Detroit
Watson, Robert W.....	Highland Park
Watters, F. L.....	M
Watts, Frederick B.....	M
Watts, John J.....	Detroit
Wax, John H.....	M
Wayne, M. A.....	Detroit
Weaver, Clarence E.....	Detroit
Webster, John E.....	M
Weed, Milton R.....	M
Wehenkel, Albert M.....	Detroit
Weiner, M. B.....	Detroit
Weingarten, David H.....	Detroit
Weisberg, A. Allen	M
Weisberg, Jacob	M
Weisenthal, Irvin	Detroit
Weiser, Frank A.....	Detroit
Weiss, J. G.....	M
Welch, John H.....	Detroit
Weller, Charles N.....	Detroit
Wellman, Waldron W.....	Detroit
Wells, Martha	Detroit
Weltman, Carl	Detroit
Wendel, Jacob S.....	Detroit
Wenzel, Jacob F.....	Detroit
Wershaw, Max	Detroit
West, Howard Gage	Detroit
Weston, Bernard	Detroit
Weston, Earl E.....	Highland Park
Weston, Horace L.....	M
Westover, Charles	Plymouth
Weyher, Russell F.....	Detroit
Whalen, Neil J.....	Detroit
Whinnery, Randall A.....	Detroit
White, Milo R.....	Detroit
White, Milton W.....	Detroit
White, Prosper D., Jr.....	M
White, Theodore M.....	Detroit
Whitehead, L. S.....	M
Whitehead, Walter K.....	Detroit
Whiteley, Robert K.....	M
Whitney, Elmer L.....	Detroit
Whitney, Rex E.....	M
Whittaker, Alfred H.....	Detroit
Wiant, R. E.....	Detroit
Wickham, A. B.....	Detroit
Wiechowski, Henry E.....	M
Wiener, I.....	M
Wight, Fred B.....	Detroit
Wilcox, L. F.....	M
Wilkinson, A. P.....	Detroit
Williams, C. J.....	Detroit
Williams, Mildred C.....	Detroit
Williamson, Edwin M.....	M
Williamson, John G.....	Dearborn
Wills, J. N.....	Detroit
Willson, Wesley W.....	M
Wilson, Charles Stuart	Detroit
Wilson, Gerald A.....	Detroit
Wilson, James Leroy	Detroit
Wilson, John D.....	Detroit
Wilson, M. C.....	M
Wilson, Walter J., Jr.....	M
Winfield, James M.....	M
Winsor, Carleton	M
Wiren, Lennart W.....	Eloise
Wishropp, E. A.....	M
Wisner, Harold E.....	Detroit
Wissman, H. C.....	Detroit
Wittenberg, Arthur A.....	Detroit
Wittenberg, Samson S.....	Detroit
Wittenberg, Sydney S.....	M
Witter, Joseph A.....	M
Witwer, Edwin R.....	Grosse Pte. Park
Wolfe, Max O.....	Detroit
Wollenberg, R. A. C.....	Detroit
Wood, Kenneth A.....	Detroit
Woodry, Norman L.....	Detroit
Woods, H. B.....	Detroit

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Woods, W. Edward.....	Detroit
Woodworth, William P.....	Detroit
Wreggit, W. R.....	M
Wruble, Joseph.....	Detroit
Wygant, Thelma.....	Detroit
Yesayan, H. G.....	Detroit
Yonkman, Frederick F.....	Detroit
York, Frederick P.....	M

Yott, William J.....	M
Young, Donald Andrew.....	M
Young, Donald C.....	M
Young, James P.....	Detroit
Young, Lloyd B.....	M
Young, Viola M.....	Detroit
Zbudowski, A. S.....	M
Zbudowski, Myron R.....	M
Zemens, Joseph L.....	Grosse Pte. Woods

Zimmerman, Israel J.....	M
Zimmerman, R. L.....	Detroit
Zinn, George H.....	Detroit
Zinterhofer, John.....	Detroit
Zinterhofer, Louis.....	Detroit
Zlatkin, Louis.....	Detroit
Zolliker, Carl R.....	Detroit
Zuelzer, Wolfgang.....	Detroit
Zukowski, Sigmund A.....	M

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Brooks, G. W.....	Tustin
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Daugherty, R.....	M
Gruber, John F.....	Cadillac
Hoagland, F. L.....	M
Holm, Augustus.....	Leroy
Holm, Benton.....	Cadillac

Hoover, J. W.....	Ervart
Inman, J. C.....	M
Lommen, Ralph.....	Manton
McCall, James H.....	Lake City
McManus, Edwin.....	Mesick
Masselink, H. J.....	McBain
Merritt, C. E.....	Manton
Mills, Robert E.....	Boon

Moore, G. P.....	M
Moore, Sair C.....	Cadillac
Murphy, Michael R.....	Cadillac
Purdy, Calvin S.....	Buckley
Seltzer, Sol Norris.....	Marion
Showalter, Lawrence E.....	M
Smith, Wallace.....	Cadillac
Tornberg, Gordon C.....	Cadillac
Wood, George H.....	Reed City

BARBITURIC CONTROL ACT

The 1943 Michigan Legislature passed Act 204 to regulate the sale and possession of barbituric acid and any of its derivatives, chloral hydrate, or paraldehyde.

Section 1-b reads:

"Licensed physicians, dentists and veterinarians may dispense or prescribe barbituric acid and any of its derivatives, chloral hydrate or paraldehyde: Provided, That a record of all such dispensations, except administration to a patient upon whom such physician, dentist

or veterinarian shall personally attend, shall be kept showing the date when issued and bearing the name and address of the patient for whom, or the owner of the animal for which the drug is dispensed, which record shall be open to inspection by any officer of any organized police force of this state or any prosecuting attorney or his investigators."

Act 204, P.A. of 1943 (which becomes effective July 30, 1943) will be published in full in the June MSMS JOURNAL.

REVISION OF MICHIGAN WORKMEN'S COMPENSATION ACT

Do you know about the recent changes in the Workmen's Compensation Act as amended by the 1943 Michigan Legislature, and how these changes may affect you?

1. The Act provides for increased liability on the part of the employer for medical care. The period has been increased from ninety days to six months with an additional six months possible at the discretion of the Commission.

2. The Act provides compensation for all occupational diseases (blanket coverage) in contrast to the thirty-one occupational diseases scheduled in the old law.

3. The Act provides for waivers for silicosis and other dust diseases under special circumstances. This clause practically makes it mandatory for each industry to adopt a medical program for self-protection. It now only compels management to examine all new em-

ployees but also those now employed, since industry becomes liable for all dust diseases of the lung not formerly covered by the old law. Prior to the enactment of the 1943 amendment, silicosis was compensable only in the mining industry. Similar cases now existing in other industries become compensable and if not discovered by medical examination and a waiver obtained, the company becomes liable.

Written request for such waiver must be filed with the Michigan Department of Labor and Industry on or before 120 days from July 30, 1943—the effective date of the new law.

If a worker is not examined the company employs him "as is" and becomes liable for compensation.

Further information relative to this law (Act 245, P.A. 1943) may be obtained by writing the Industrial Health Committee, Michigan State Medical Society, 2020 Olds Tower, Lansing.

* YOU AND YOUR BUSINESS *

PROGRAM OF MATERNITY AND INFANT CARE FOR WIVES AND INFANTS OF ENLISTED MEN

The First Deficiency Appropriation Act of 1943, approved March 18, makes available \$1,200,000 for the period ending June 30, 1943, for grants to States to provide medical, nursing, and hospital maternity and infant care for wives and infants of enlisted men in the armed forces of the fourth, fifth, sixth and seventh grades. Allotments would be made by the Secretary of Labor based on plans developed and administered by state health agencies and approved by the Chief of the Children's Bureau. Those benefited would be the wives of privates, privates first-class, corporals, and ordinary sergeants—and comparable grades in the Navy, Marine Corps, and Coast Guard.

Additional funds for the same purpose, not in excess of \$6,000,000, would be authorized by a Congressional bill (H.R. 2041) pending in the House Committee on Labor. This specifically states that the facilities shall be provided by or through official State or local health agencies; it also provides for coöperation with the medical, nursing and welfare groups and organizations.

Plans for administration of the program are being considered by the MSMS Child Welfare Committee and the Maternal Health Committee, at the invitation of the Michigan Department of Health. The development of a workable plan, to insure the best type of medical service for the recipients of this bounty and to preserve the physician-patient relationship, will be announced by The Council, after it has studied the recommendations of the two State Society committees now working on the proposed program.

* * *

NO RECORD REQUIRED IN "ADMINISTRATION" OF NARCOTICS

Are practitioners of medicine required to keep a record of narcotics dispensed to persons upon whom they are in personal attendance, in the course of their professional practice?

The answer to this question, as interpreted by the U. S. Bureau of Narcotics, is as follows: "If a physician dispenses directly to a patient a dose of narcotic drug at the patient's bedside or in the physician's office, such administration of the narcotics is in the course of personal attendance, and, assuming, of course, that the administration is for a bona fide medical purpose, no record is required to be kept of the dispensing of this dose of narcotic drug. Should the physician leave a number of narcotic tablets at the patient's home or deliver to the patient in the doctor's office additional tablets for subsequent administration by a nurse or relative of the patient, in accordance with directions left by the physician, such as might be done in the case of a person suffering from malignant cancer, the Bureau

is of the opinion that the physician is required to keep a record of the narcotic tablets thus left for subsequent administration."

This interpretation was verified by the U. S. Supreme Court in the case of Peter Young vs. United States of America, decided February 2, 1942.

* * *

COMMUNICABLE DISEASES EXCLUDED FROM CRIPPLED-AFFLICTED CHILDREN ACTS

"Are indigent children suffering with pneumococcic pneumonia eligible for State aid under the Afflicted Children's Act?"

The answer to this inquiry received from a member is "No." The reason is that such a pneumonia is considered a communicable disease and the Afflicted Child Act, in Section 9, states: "Any child who shall be diagnosed after admission as a crippled child as defined by the crippled children's act, or as suffering at admission only from acute pulmonary tuberculosis, or only from any other communicable disease, or only from an incurable mental illness or defect shall be retained in the hospital under this act only for such period as may be necessary to discharge him to his home or to the jurisdiction of some other state act for the care of afflicted children. Appropriate rules and regulations may be adopted to effectuate the transfer of patients pursuant to this section."

The expenses of all such cases are charged back either to the county or to some other state agency. The same applies to crippled children by rule of the Crippled Children Commission.

* * *

MICHIGAN'S INDUSTRIAL MEDICAL-SURGICAL CONFERENCE A SUCCESS

Four hundred five (405) was the total registration at the Postgraduate Industrial Medical and Surgical Conference of April 8, held in Detroit and sponsored by the Industrial Health Committee of the Michigan State Medical Society. The audience included doctors of medicine, nurses, hygienists and representatives of labor and industry. The program was stellar in quality featuring such eminent lecturers in the industrial medical field as J. G. Townsend, M.D., Bethesda, Md.; Louis Schwartz, M.D., Bethesda, Md.; C. M. Peterson, M.D., Chicago; R. D. McClure, M.D., Detroit; Max Burnell, M.D., Flint; Frank F. Tallman, M.D., Lansing; J. J. Bloomfield, Bethesda, Md.; Andrew T. Court, Detroit; E. P. Chester, Hartford, Conn.; L. J. Carey, Detroit; John W. Gibson, Lansing; and John L. Lovett, Detroit.

The five round-table discussions, held immediately after the "standing-room-only" luncheon, had capacity attendance. The leaders of these question-and-answer periods were: H. H. Riecker, M.D., Ann Arbor; Louis

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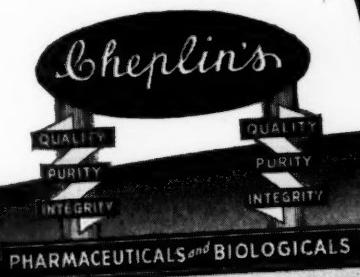
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In 20 cc. ampules (for intravenous use) containing 7½ gr. (0.48 Gm.), in boxes of 6, 25 and 100.

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Schwartz, M.D., Bethesda, Md.; B. J. Hein, M.D., Toledo; Parker Heath, M.D., Detroit; and Carl Badgley, M.D., Ann Arbor. Participants in the conferences were: Frank N. Wilson, M.D., Ann Arbor; H. H. Gay, M.D., Midland; Harthur L. Keim, M.D., Marion Jocz, M.D., George Van Rhee, M.D., Earl G. Kreig, M.D., Donald W. Hedrick, M.D., W. T. Krebs, M.D., Jacob Manning, M.D., A. H. Whittaker, M.D., Joseph G. Molner, M.D., all of Detroit; S. W. Donaldson, M.D., Ann Arbor; and Mr. James L. Hill, member of Department of Labor and Industry, Lansing.

At the banquet, Mr. Charles F. Kettering of General Motors, Detroit, presented a very interesting and witty address which was extremely thought-provoking to the large number of medical men in attendance.

The meeting was attended by physicians from many parts of the country, including Regina, Sask., Canada; South Gate, California; Bristol, Conn.; Meridian, Conn.; Washington, D. C.; Chicago, Ill.; Melrose Park, Ill.; Anderson, Indiana; Indianapolis, Ind.; Kokomo, Ind.; Muncie, Ind.; Baltimore, Maryland; Crookston, Minnesota; Kansas City, Mo.; Buffalo, N. Y.; Lockport, N. Y.; New York City, N. Y.; North Tarrytown, N. Y.; Rochester, N. Y.; Saranac, N. Y.; Syracuse, N. Y.; Glenridge, N. J.; Harrison, N. J.; Linden, N. J.; Newark, N. J.; Rahway, N. J.; Trenton, N. J.; Cleveland, Ohio; Dayton, Ohio; Lima, Ohio; Norwood, Ohio; Toledo, Ohio; Vandalia, Ohio; Warren, Ohio; Oshawa, Ont.; Walkerville, Ont.; Windsor, Ont.; Philadelphia, Pa.; San Antonio, Texas.

* * *

TEMPORARY EXPEDIENTS

Seductive arguments are put forth favoring the lowering of educational standards in order to hasten the graduation of a larger number of medical students. Sympathies of legislators and governmental officials are played upon, to induce them to relax the restrictions on the practice of medicine, and to permit practitioners whose qualifications are questionable or unknown to practice under a "temporary license."

A wise man once said^d that there is nothing more permanent than a temporary expedient. Men are prone to follow the line of least resistance and to permit the temporary expedient to become permanent policy rather than to fight to abolish it. Reducing the quality of service, lowering standards of education, and relaxing laws governing qualifications and licensure of practitioners would be simply playing into the hands of charlatans and incompetents and worse, and cannot be justified on grounds of temporary necessity or expediency.

Temporary expedients may sometimes be necessary to meet present emergencies, but let us not forget that such expedients should be temporary; let us not be beguiled into believing that a temporary change in direction should take the place of our permanent, long-range course. This applies not only to the professions. Every citizen of this Republic should recognize this principle, for the problems of the professions are essentially the problems of America. We all belong to one Commonwealth which has prospered and grown strong under the "American way of life." It is a prime

YOU AND YOUR BUSINESS

duty of us at home to see to it that temporary expedients are abandoned when the emergency is past and that the soldiers come back to the kind of America for which they are fighting.—STEPHEN H. BAXTER, President, Minnesota State Medical Association, *Minnesota Medicine*, March, 1943.

NATIONAL HEALTH COUNCIL

A National Health Advisory Council was organized in Washington, February 5, 1943, to project and carry out a broad program looking to health conservation as one of the most important factors in winning the war.

The Council was created by the Chamber of Commerce of the United States to consider national health problems in relation to the war program.

The meeting was opened with a statement by National Chamber President Eric A. Johnston, which said:

Disease and physical disability in war production constitute one of the most serious threats to speedy victory. Medical authorities estimate that a well-thought out program, vigorously carried out, could add the full time of as many as one million workers to the war program. We must disarm and defeat disease on the home front if we are to make early victory possible. Even partial conquest in that direction would add greatly to the nation's manpower resources, now presenting one of the war program's most difficult problems.

"And, aside from the direct benefits accruing to the war effort from health conservation, we must consider the staggering cost of disease. Together with physical disability, it is taxing the American people \$10,000,000,000 a year. This tax everyone pays and no one gets. It is a 5 to 10 per cent drag on war operations."

General chairman of the Council is Dr. James S. McLester, professor of medicine at the University of Alabama, who outlined the contemplated nationwide program. He said:

"The plan is for a broad educational effort designed to raise the nation's health levels. Once established, it is earnestly hoped these levels can be maintained after the war is won, as a means of continuing improvement of the national welfare.

"It is intended to promote both within and out of industry personal health, safety, nutrition and physical conditioning, with particular emphasis on war emergency needs and conditions. The program will be made available widely to industrial organizations, chambers of commerce and communities. In any community it can be applied to reduce work absence, raise the morale and increase the physical effectiveness of workers and to assist their families in problems of health, diet, illness and nursing.

"War Production officials are appealing to War Production Drive Committees, of which there are nearly 2,000 in war plants, to keep the American workman healthy and fit, so as to gain man hours in production. Only healthy workers can supply the needed drive to keep our armed forces supplied with the implements of war.

"Few investments can yield the returns that will come from an aggressive effort to better the national health."

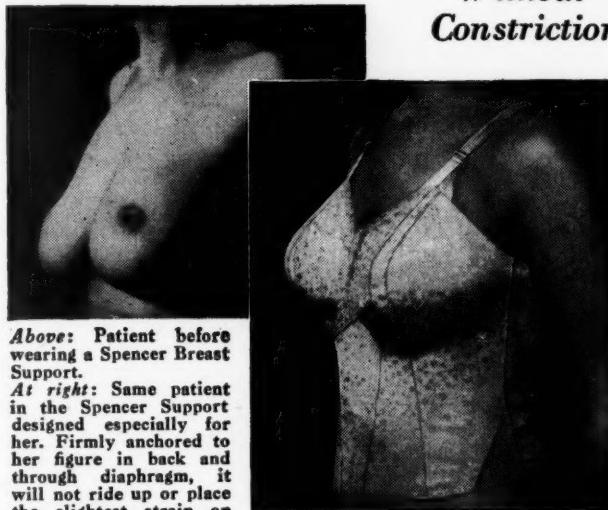
Members of the Council from Michigan are Dr. Henry F. Vaughan, University of Michigan, represented by Dr. Nathan Sinai, and Dr. John J. Prendergast,

MAY, 1943

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Reports were made by three committees of the council. The committees and their chairmen are Community Health Committee, Dr. Smillie; Industrial Health Committee, Dr. Bristol; and Individual Health Committee, Dr. James E. Paullin, Professor of Medicine, Emory University, Atlanta, Georgia.

At a luncheon meeting Dr. Thomas Parran, surgeon general of the United States, talked on the health state of the nation.

ANNIVERSARY DINNER

The East Side Physicians' Association, Detroit, held its 30th Anniversary on April 30 at an "Old Timer's Dinner" in the Wayne County Medical Society Headquarters. Howard W. Peirce, M.D., was chairman, and Louis J. Hirschman, M.D., acted as toastmaster. Talks were given by Hugh Harrison, M.D.; R. L. Clark, M.D.; William Hipp, M.D.; L. O. Geib, M.D.; Henry A. Luce, M.D.; Harry L. Clark, M.D.; A. H. Whittaker, M.D.; A. S. Brunk, M.D.; B. U. Estabrook, M.D., and William J. Burns. Interesting and amusing tales concerning the early practice of medicine in Detroit were recounted. Hugh Harrison, who started practicing in June, 1896, recalled how he had the only telephone in the neighborhood: "Neighbors occasionally requested the use of my phone, and then called up their own doctor!" Many physicians recalled riding bicycles in the early days of their practices.

Among those present were: W. D. Barrett, M.D.; Alex. W. Blain, M.D.; J. R. Boland, M.D.; A. S. Brunk, M.D.; Clifford F. Brunk, M.D.; Cornelius Carey, M.D.; Harry L. Clark, M.D.; H. B. Garner, M.D.; L. O. Geib, M.D.; A. A. Gronow, M.D.; Joshua Hanser, M.D.; Hugh Harrison, M.D.; Louis J. Hirschman, M.D.; William Hipp, M.D.; Arthur J. Jones, M.D.; R. G. James, M.D.; Charles W. Knaggs, M.D.; Henry A. Luce, M.D.; Robert C. Moehlig, M.D.; Howard W. Peirce, M.D.; H. A. Reye, M.D.; E. L. Robinson, M.D.; Arthur E. Schiller, M.D.; H. L. Ulrich, M.D.; V. L. VanDuzen, M.D., of Grand Rapids; Milton D. Vokes, M.D., and A. H. Whittaker, M.D.

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Communication

A REPLY TO THE EDITORIAL ON REFUGEE PHYSICIANS

Dear Doctor:

Your objections to our colleagues are as follows: (1) They are unqualified; (2) will lower medical standards; (3) will usurp the places of the "boys" at the front.

These charges are unfounded. It is ridiculous for any thinking person to conclude that a total of 6,000 could cause such manifold dislocations in a population of over 130,000,000 peoples.

The fact remains that there may be some United States graduates, now practicing, who could not meet modern standards, or examinations and so with the refugee group also. Some, however, have had international reputations before the Hitler era.

It is a sad commentary on our vaunted hospitality, and American spirit of fair play, that we should treat this group with such *fear, indifference* and even *hatred*. Wouldn't it have been to our honor and pride to have offered these colleagues a *Constructive Program*, based on good will?

The founding fathers of our dear old U. S. A. were also refugees. They fostered opportunity and justice for all. The editor's plan to regiment this group by government employment may be interpreted by the government as an invitation to extend this plan to others, too.

A constructive program (by Refugee Committees) as refresher courses, preceptorships, residencies, et cetera, for periods of six months to a year or longer, should suffice to enable the large majority of this group to do effective medical work and this should lead to licensing.

In many cities, towns, and hamlets, the osteopath, the chiropractor and the cultist, have taken over completely when our members have left for U. S. Service. This group under NO discipline of organized medicine will be a serious threat to the returning men. Another example of the—"too little, and too late."

There is a shortage of medical man power. Let us harken to the wise words of the master ship builder, Henry Kaiser, and take unselfish progressive steps to meet a changing situation. The refugee M. D. offers us an opportunity. Are we following the "Golden Rule" in this problem?

S. E. BARNETT, M.D.

25 Parsons Street,
Detroit, Michigan.

The Michigan Crippled Children's Commission, as recently reorganized by Governor Harry F. Kelly, is composed of Emmet Richards, Alpena; Maxwell Reynolds, Marquette; George R. Cooke, Grosse Pointe Farms; Roger V. Walker, M.D., Detroit, and Nate S. Shapero, Detroit.

MAY, 1943

Say you saw it in the Journal of the Michigan State Medical Society

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BLENDED SCOTCH WHISKY

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Woman's Auxiliary



OUR ANNUAL MEETING PLANS

Although the Annual Meeting is September 21-22 in Detroit, it is only a stone's throw away, and we should be organizing our plans. Every effort is being

made to develop a streamlined convention in order to plan the most for the least amount of your time. Have you appointed your delegates, and made your reservation with the hotel? While we think it is one of the nicest places for the meeting, it is equipped to accommodate just

so many. Be sure to make your reservations early.

Many changes have been made in our officers and chairmen this year due to the war. Many of our members are leaving the state to accompany their husbands to army camps. Most recent among our losses is our press chairman, Mrs. Hira Branch, who has gone to Texas. We regret to lose her but we must carry on. Send your press notices to the secretary, Mrs. Wm. B. Hubbard, 1205 Maxine St., Flint, or to your president, so we may keep the press scrap book up to date. Mrs. Branch informed me that clippings were not coming in very well. We want you to be proud of your Auxiliary when the press scrapbook is displayed at the convention.

During May, speakers are available through your own Speakers Bureau of the Civilian Defense on "War and Tuberculosis." We urge you to present one of these speakers at your meeting. Also keep in mind the contest on Tuberculosis that the Executive Board voted to sponsor again next year.

Mrs. Roger V. Walker, 1507 Iroquois Ave., Detroit, Michigan, would like all By-laws' revisions sent to her as soon as possible so as to be ready for the convention.

Remember the convention and make your reservation early.

Sincerely yours,

MRS. G. L. WILLOUGHBY, President

* * *

GENESEE COUNTY

The Woman's Auxiliary of the Genesee County Medical Society held its annual meeting Tuesday, March 23, at the Durant Hotel.

Mrs. Arthur Kretchmar was elected president; Mrs. Don Wright, president-elect; Mrs. Herbert White, vice president; Mrs. Eugene Smith, secretary; Mrs. Clayton Stroup, treasurer.

Mrs. Alvin Thompson, the retiring president, was presented with a corsage and a gift as appreciation of completing the term of office of Mrs. Stephen Gelenger, who resigned to accompany her husband to an army hospital.



A committee was appointed to work with the Office of Civilian Defense, in organizing Neighborhood War Clubs in the city. A committee was also appointed to meet with the Doctors to make plans, furnish emergency kits for soldiers, and gifts for our Doctors in the service.

The committee in charge of arrangements were: Mrs. Don Wright, Mrs. R. W. MacGregor, and Mrs. G. L. Willoughby.

* * *

KENT COUNTY

The Woman's Auxiliary to the Kent County Medical Society will have its annual Spring Tea, Wednesday, April 14, at two o'clock, at the home of Mrs. Carl Snapp, 980 Plymouth Road S.E.

* * *

INGHAM COUNTY

At the regular business meeting of the Woman's Auxiliary to the Ingham County Medical Society, at which Mrs. Milton Shaw, president, presided, Mrs. Frank B. Heckert, secretary, reported on work done by auxiliary members. This included eighty-four baby blankets, 132 towels made and sixteen hours spent folding bandages for the St. Lawrence hospital, 720 pads made and 530 sponges counted for the Edward W. Sparrow hospital. Fifty-two hours of work were given each institution during January, Mrs. Heckert said.

Mrs. Horace L. French, welfare chairman, reported that 540 stitched dressings were made on emergency call, in co-operation with the Red Cross surgical dressing unit at Plymouth Congregational Church.

The auxiliary voted to contribute a substantial sum of money to the Ingham County War fund, and in response to a request from the civilian defense office, members voted to assist in the rationing schedule registering within the next few weeks, and to help with clerical work for the approved agencies of the county defense council when the need arises.

* * *

JACKSON COUNTY

The Woman's Auxiliary to the Jackson County Medical Society reports that their outstanding meeting was held recently in the Hotel Hayes.

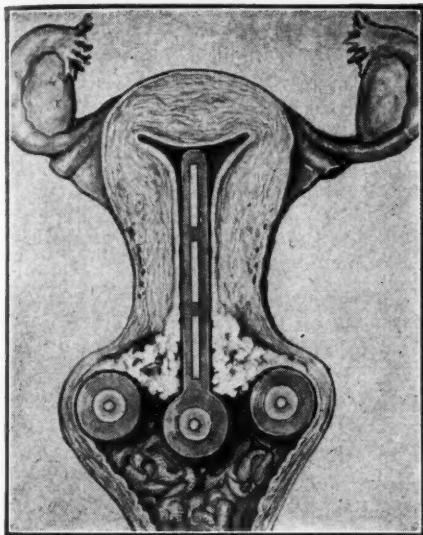
Mrs. E. O. Leahy, president, conducted the business session, and welcomed the members.

Mrs. Thomas Hackett, program chairman, presented members of the auxiliary who created a picture of the war activities as follows:

Mrs. R. H. Alter, chairman of Junior Red Cross; Mrs. G. R. Bullen, member of Red Cross First Aid committee; Mrs. Charles Dengler, chairman of Red Cross Home Nursing; Mrs. Don Kudner, Red Cross Motor Corps, and chairman of Red Cross Blood Donors; Mrs. W. E. McGarvey and Mrs. M. N. Stewart of Emergency Shelter nurses and OCD Blood Bank;

(Continued on Page 412)

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Gentlemen: Please send me information on the following Burdick Physical Therapy Equipment:

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MAY, 1943

Say you saw it in the Journal of the Michigan State Medical Society

* COUNTY AND PERSONAL ACTIVITIES *

100 PER CENT CLUB FOR 1943

Barry County—H. S. Wedel, M.D., Secretary
Branch County—James Bailey, M.D., Secretary
Cass County—K. C. Pierce, M.D., Secretary
Chippewa-Mackinac—David Littlejohn, M.D., Secy.

Clinton County—T. Y. Ho, M.D., Secretary
Dickinson-Iron—E. B. Anderson, M.D., Secy.
Gogebic County—F. L. S. Reynolds, M.D., Secy.
Huron County—J. Bates Henderson, M.D., Secretary

Jackson County—H. W. Porter, M.D., Secy.
Lapeer County—H. M. Best, M.D., Secretary
Livingston County—Ray Duffy, M.D., Secretary
Luce County—Sidney Franklin, M.D., Secretary
Manistee County—C. L. Grant, M.D., Secretary
Mecosta-Osceola-Lake—John A. White, M.D., Secretary

Menominee County—Wm. S. Jones, M.D., Secy.
Midland County—H. H. Gay, M.D., Secretary
Muskegon County—Helen Barnard, M.D., Secy.
Newaygo County—W. H. Barnum, M.D., Secy.
Oceana County—W. Heard, M.D., Secretary
Ontonagon County—W. F. Strong, M.D., Secy.
Sanilac County—E. W. Blanchard, M.D., Secy.
Shiawassee County—I. W. Greene, M.D., Secy.
St. Joseph County—R. J. Fortner, M.D., Secy.
Wexford-Missaukee—B. A. Holm, M.D., Secy.

The above county medical societies have certified 1943 dues for every member of their respective societies, to be the first 100 per cent paid-up counties for this year. Michigan State Medical Society dues for 1943 are \$12.00.

A membership record was established in 1942 when the total number of Michigan State Medical Society members reached an all-time high of 4,714.

We in the United States have been at war for sixteen months. The first twenty-four months of war we will have borrowed for war \$122 billion; now face a gross debt figure topping \$210 billion by June 30, 1944.—Congressman Fred L. Crawford, 8th District, Michigan.

* * *

Wayne County Health Department—The Board of Supervisors of Wayne County have voted to establish a full-time County Health Department, effective May 1. This is the sixty-ninth Michigan county to provide full-time public health service.

* * *

"*Electrocardiography*" will be the subject of a two weeks' intensive postgraduate course at Michael Reese Hospital, Chicago, August 16 to August 28. For further information write Michael Reese Hospital, 29th and Ellis Avenue, Chicago.

Lieutenant Harry H. Kay, M.C., Station Hospital, Keesler Field, Biloxi, Mississippi: "I wish I could tell you how much I appreciate receiving the MSMS JOURNAL from you every month. It is a grand feeling to know you are remembered though you are so far away and to feel that we still belong."

* * *

War-Busy Michigan led all other states both in the number of participating communities and in awards in the National Health Honor Roll Contest, 1942. The announcement places the City of Detroit and the Saginaw County, Sanilac County and Van Buren County Health Departments on the Honor Roll.

* * *

Two counties of Michigan—Chippewa and Mackinac counties—are a part of the first military command of its kind in the United States under provisions similar to those in the Panama Canal Zone. These two counties were designated as a military area effective March 22, 1943.

* * *

J. D. Laux has resigned from Michigan Medical Service, Detroit, and has accepted a position as Senior Economist with the War Manpower Board, Washington, D. C. The Board of Directors of Michigan Medical Service, at its meeting March 31, placed a vote of thanks and appreciation to Mr. Laux for his valued service to MMS for almost four years, since the corporation was established in 1939.

* * *

C. J. Smyth, M.D., M. B. Finkelstein, M.D., S. E. Gould, M.D., of Eloise, Michigan; T. M. Koppa, M.D., and F. S. Leeder, M.D., Lansing, are authors of an original article entitled "Acute Bacillary Dysentery (Flexner)," which appeared in the JAMA, April 24.

F. W. Hartman, M.D., Broch Brush, M.D., and K. W. Warren, M.D., of Detroit, are co-authors of "Pectin Solution in Shock," which appears in the same issue.

* * *

Captain Paul H. Jordan, M.C., Stark General Hospital, Charleston, South Carolina: "Just a word to express my appreciation for the courtesy of the Society in retaining our membership in force and forwarding the MSMS JOURNAL to those of us who are in the armed forces. I find it invaluable as an aid to keeping in touch with what is going on in the medical field there."

* * *

The Michigan Pathological Society held its regular bi-monthly meeting on April 10, at Herman Kiefer Hospital, Detroit. Forty-one members and guests were in attendance. A seminar on "Diseases of the Lymphatic System" was presented. Case presentations were given by: O. W. Lohr, M.D., Saginaw; S. E. Gould, M.D., Eloise; Lt. W. L. Lehman, M.C., USNR, New Orleans, La.; H. E. Cope, M.D., Lansing; J. G. Christopher, M.D., and F. W. Hartman, M.D., Detroit; S. M.

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COUNTY AND PERSONAL ACTIVITIES

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MILITARY POLICY
to the profession in the Armed Forces at a
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Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

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ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting May 3, 17, 31, June 14, and 28, and every two weeks throughout the year.

MEDICINE—Two Weeks' Intensive Course starting June 7. One Month's Course in Electrocardiography and Heart Disease starting the first of every month, except August. Two Weeks' Course in Electrocardiography starting August 2.

FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course starting June 14 and October 18.

GYNECOLOGY—Two Weeks' Intensive Course starting June 28. One Month's Personal Course starting August 2. Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting October 4.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting September 13. Course in Refraction Methods October 4.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting September 27.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every week.

UROLOGY—Two Weeks' Course and One Month's Course available every two weeks.

CYSTOSCOPY—Ten-day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

Aesselstine, M.D., Windsor, Ontario; D. H. Kaump, M.D., Detroit; H. R. Prentice, M.D., Kalamazoo; Gabriel Steiner, M.D., and L. Berman, M.D., Detroit.

The next meeting will be held at the Bronson Methodist Hospital, Kalamazoo, on June 12, 1943. The subject will be "Infections produced by parasites, including fungi and higher bacteria."

* * *

Three new Lieutenant Colonels have been created from among the military members of the Michigan State Medical Society: Lt. Colonel H. S. Collisi, M.C., of Billings General Hospital, Fort Benjamin Harrison, Indiana; Lt. Colonel Marsh W. Poole, M.C., Bushnell General Hospital, Brigham City, Utah; Lt. Colonel Walter M. Bartlett, Executive Officer, 315 Station Hospital, Camp Bowie, Texas. Dr. Collisi is a Grand Rapids surgeon; Dr. Poole comes from Detroit; and Dr. Bartlett is from Benton Harbor.

Congratulations Lt. Colonel Bartlett, Collisi, and Poole!

* * *

Your Friends

C. V. Mosby Company, St. Louis, Missouri
The National Livestock and Meat Board, Chicago, Illinois
Parke, Davis & Company, Detroit, Michigan
Pelton & Crane Company, Detroit, Michigan
Pet Milk Company, St. Louis, Missouri
Petrogular Laboratories, Chicago, Illinois
Philip Morris & Co., Ltd., New York, N. Y.
Philosophical Library, New York, N. Y.
Picker X-Ray Corporation, New York, N. Y.
Proctor & Gamble, Cincinnati, Ohio

The above ten firms were among exhibitors at the 1942 MSMS annual meeting in Grand Rapids and helped make possible for your enjoyment one of the outstanding state medical meetings in the country. Remember your friends when you have need of equipment, medical supplies, appliances or service.

* * *

Cost of an American Beveridge Plan. The recent cradle-to-grave security program, as transmitted to Congress from the National Resources Planning Board has been translated into dollar costs by Gerhard Hirschfeld, Research Director of the Insurance Economics Society of America. The plan when in full swing, would amount to \$15,097,000,000 per annum:

SOCIAL INSURANCE BENEFITS:

Retirement pensions.....	\$ 3,700,000,000
Widow's and guardian benefits.....	590,000,000
Unemployment benefits.....	2,025,000,000
Disability benefits.....	1,365,000,000
Maternity grants and benefits.....	140,000,000
Marriage grants.....	20,000,000
Funeral grants.....	80,000,000
Cost of administration (5%).....	400,000,000

Total \$ 8,320,000,000

NATIONAL ASSISTANCE:

Total	940,000,000
-------------	-------------

CHILDREN'S ALLOWANCES:

For children	2,400,000,000
Cost of administration (3%)	72,000,000

Total \$ 2,472,000,000

HEALTH SERVICES:

Total	3,365,000,000
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Grand Total \$15,097,000,000

JOUR. MSMS

COUNTY AND PERSONAL ACTIVITIES

MSMS ANNUAL MEETING Detroit—September 22, 23, 24

The 1943 Postgraduate Conference on War Medicine—the 78th annual meeting of the Michigan State Medical Society—will be held at the Statler Hotel, Detroit, in September. The scientific program will be as high-class as in the past, including such medical stars as:

Medicine—Walter C. Alvarez, M.D., Rochester, Minn.

Pathology—Paul R. Cannon, M.D., Chicago

Radiology—E. L. Jenkinson, M.D., Chicago

Pediatrics—Sister Elizabeth Kenny, Minneapolis, Minn.

Ophthalmology—Peter C. Kronfeld, M.D., Chicago

Surgery—Frank H. Lahey, M.D., Boston

Otolaryngology—Harold I. Lillie, M.D., Rochester, Minn.

Pediatrics—Irvine McQuarrie, M.D., Minneapolis, Minn.

Gynecology—Robert D. Mussey, M.D., Rochester, Minn.

General Practice—James E. Paullin, M.D., Atlanta, Ga.

Maternal Health—Edward A. Schumann, M.D., Philadelphia

Surgery—Kellogg Speed, M.D., Chicago

Psychiatry—John C. Whitehorn, M.D., Baltimore, Md.

In addition, other eminent speakers have been invited to address the General Assembly on subjects dealing with Dermatology, Obstetrics, Anesthesiology, and other phases of medicine, surgery, and pediatrics.

This concentrated three-day postgraduate course presents an opportunity of the greatest worth to every practitioner of medicine in Michigan.

"Will You Cash a Check?"

Check up on the checks you cash.

That's the advice of the U. S. Secret Service to Doctors of Medicine who cash checks and to the people of America who have checks to cash, for 1943 will see more government and industrial payroll and commercial checks in use than in any year in U. S. history.

If you are cashing a patient's check, make sure you know how to find the endorser if the check "bounces." Should a bank return the check and you cannot find the person who passed it, it will be your loss.

The Secret Service, which authored the successful "Know Your Money" campaign against counterfeit currency, has extended its educational program to cover checks. "Know Your Endorsers" is the advice it gives to professional people, merchants, and others who are in a position to cash the public's checks.

Resolution re Hygeia, the Health Magazine.—The following resolution was unanimously adopted by the MSMS House of Delegates at its Grand Rapids meeting of September 21-22, 1942:

WHEREAS, the War Production Board advises that

MAY, 1943

Say you saw it in the Journal of the Michigan State Medical Society

HAY FEVER EXTRAORDINARY EFFECTIVE TREATMENT for previously non-responsive patients

Designed for Practical Use by ALL Physicians in this Locality

Today's most effective treatment of Hay Fever is based upon testing with the correct selection of local pollens and fungi. Testing technic is simple. It takes but a few minutes to run through the Barry selection for your locality. A Barry Testing Kit may be obtained for your patient containing the specific irritants determined by accurate botanical studies and pollen counts.

TREATMENT: Skin test reactions of the local pollens and fungi and a brief history are all that are needed to institute a suitable treatment series with Barry products. This specialized service permits incorporation of ALL the proper irritants in the proportions that will give most satisfactory results. Each treatment set is "TAILOR-MADE" to meet your own patients' requirements at ordinary stock set cost.

Give your patients the benefit of a scientific treatment that is patterned after allergists' most successful methods.

WRITE TODAY for your Barry Testing Kit containing 20 local pollens and fungi. Complete set 50c.

SPECIAL SERVICE BULLETINS M5 AVAILABLE

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¶ All worth while laboratory examinations; including—

Tissue Diagnosis

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Blood Chemistry

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Basal Metabolism

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Intravenous Therapy with rest rooms for Patients.

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Saginaw

Phone, Dial 2-3893

The pathologist in direction is recognized by the Council on Medical Education and Hospitals of the A. M. A.

COUNTY AND PERSONAL ACTIVITIES

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\$5,000.00 ACCIDENTAL DEATH \$25.00 weekly indemnity, accident and sickness	For \$32.00 per year
\$10,000.00 ACCIDENTAL DEATH \$50.00 weekly indemnity, accident and sickness	For \$64.00 per year
\$15,000.00 ACCIDENTAL DEATH \$75.00 weekly indemnity, accident and sickness	For \$96.00 per year

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\$200,000 deposited with State of Nebraska for protection of our members.

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sick and injured war production workers lose 6,000,000 workdays each month, and,

WHEREAS, Donald Nelson, Chairman of the War Production Board, and Paul V. McNutt, Chairman of the War Manpower Commission, and others are urging that every state and community make it their job to take an active part in saving as many of those lost days as possible for the Production Drive and keep the nation's workers on the job and physically fit, and

WHEREAS, The National Research Council is asking the general public to focus its attention on proper food and nutrition for better health defense, and

WHEREAS, there is an urgent need for authentic health information and first aid training in home and factory and among the men in the Army camps and Naval stations, and by Red Cross workers, block captains, and civilian defense authorities, and,

WHEREAS, thousands of physicians have already left civilian practice to enter the armed forces and by the end of this year more than 25 per cent of the active medical profession will be out of general practice, and,

WHEREAS, the increased public demand for health information cannot be met alone by the heavily worked physicians who remain in private practice, and,

WHEREAS, it remains the responsibility of the medical profession to do its utmost in disseminating to the laity health information and sound advice, and

WHEREAS, in 1921 at the Boston session of the American Medical Association, the House of Delegates authorized the publication of *Hygeia, The Health Magazine*, which was designed to give sound health information in nontechnical language, to interpret the progress in scientific and preventive medicine, and to discourage the reliance on quacks and the use of patent medicines, and,

WHEREAS, there is no other national magazine in the field of health that offers the large amount of authentic health information in lay language, and,

WHEREAS, this magazine, under careful scrutiny of the American Medical Association, maintains high professional standards of accuracy in its editorial and advertising policy,

THEREFORE, BE IT RESOLVED, that the House of Delegates of the Michigan State Medical Society, in recognition of the great public need for reliable health information and in recognition of the Service that *Hygeia, The Health Magazine*, can perform in terms of industrial, civilian and community health, hereby endorse this magazine, and to this end recommend that officers and members of the county medical societies of the Michigan State Medical Society urge wider recognition of *Hygeia* in their communities.

BE IT FURTHER RESOLVED that we offer full support and complete co-operation to the Woman's Auxiliary to the Michigan State Medical Society and its affiliated units in their efforts to disseminate health information through *Hygeia, The Health Magazine*, and to urge them to introduce *Hygeia* in war industries, Army camps, USO Centers, reception rooms of physicians and dentists, and among their patients, in homes, schools, teachers' colleges, libraries, parent-teacher organizations, private clubs and other community centers.

BE IT FURTHER RESOLVED that copies of this resolution be sent to the Editor of *Hygeia* at the headquarters of the American Medical Association in Chicago and to the secretary of each component county medical society of the Michigan State Medical Society with the request that this resolution be read at the next stated meeting and similar action taken to co-operate in this health education campaign by widening the distribution of *Hygeia, The Health Magazine*.

IN MEMORIAM

IN MEMORIAM

DIED IN MILITARY SERVICE

Lieutenant Ralph H. Sullivan, M.C., of Lansing, was born November 26, 1913, in Anderson, Indiana, and was graduated from the University of Michigan Medical school in 1940. He served his internship in St. Lawrence Hospital in 1941, and was its resident physician in 1942, entering the armed forces in July of that year. For three years he was connected with the 119th Field Artillery of the Michigan National Guard. Doctor Sullivan was killed while on a routine flight near Tonapah, Nevada, where he was the flight surgeon for the 362nd Fighter Squadron, stationed at the gunnery and bombing range there. He died March 26, 1943.

Guy Leartus Connor of Detroit, was born October 10, 1894 in Detroit and was graduated from Johns Hopkins Medical School in 1901. Doctor Connor was assistant clinical professor of neurology, psychiatry and preventive medicine. He was medical director of the Detroit Board of Education from 1914 to 1935. For years he was a member and Secretary of the Michigan State Board of Registration in Medicine, and was attending neurologist at the Children's Hospital, Harper Hospital, and St. Mary's Hospital. He was a Fellow of the American College of Physicians, a member of the Detroit Academy of Medicine, and the Detroit Society of Neurology and Psychiatry. Doctor Connor died in Fort Lauderdale, Florida, April 19, 1943.

* * *

John J. Corbett of Detroit was born in Syracuse, New York, in 1893, and was graduated from the Syracuse University Medical School in 1917. After serving as a captain in the Medical Corps in World War I, Doctor Corbett came to Detroit and entered practice in 1920. He was a frequent contributor to medical journals and was a Fellow of the American College of Surgeons, of the American Proctological Society, a member of the Founders Group of the American Board of Proctology, and an associate professor of proctology at Wayne University Medical School. Doctor Corbett died April 10, 1943.

* * *

Willoughby L. Godfrey of Battle Creek was born April 25, 1852 in Battle Creek, and was graduated from the University of Michigan Medical School in 1876. He began practice in Battle Creek, but after a year went to Williamson, New York, to become associated with his uncle, Lathrop Sprague,

MAY, 1943

DEPENDABLE
LABORATORY

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M.D. He later returned to Battle Creek, where he remained until 1928, when he retired. Doctor Godfrey was one of the earliest members of the Calhoun County Medical Society, serving as its president in 1917. He was elected to Honorary Membership in the Michigan State Medical Society in 1929. Doctor Godfrey died at the age of ninety years on April 7, 1943.

WOMAN'S AUXILIARY

(Continued from Page 404)

Mrs. C. Schepler, chairman of Brooklyn Red Cross program; Mrs. A. M. Schaeffer, secretary of the executive committee of the Red Cross; Mrs. J. C. Smith, of the Gray Ladies, and house committee of the Red Cross; Mrs. M. V. Susskind, teacher of bacteriology at Mercy Hospital.

Besides their Red Cross activities, the group has furnished cookies for the soldiers and assisted in packing boxes for Doctors in service.

A musical interlude was given by Miss Agnes Wardroper, pianist, accompanied by Mrs. Schaeffer, when she led the group in singing.

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Acknowledgment of all books received will be made in this column and this will be deemed by us as a full compensation of those sending them. A selection will be made for review, as expedient.

SYNOPSIS OF DISEASES OF THE SKIN. By Richard L. Sutton, M.D., Emeritus Professor of Dermatology, University of Kansas Medical School, and Richard L. Sutton, Jr., M.D., Assistant Professor of Dermatology, University of Kansas Medical School. With 413 illustrations. St. Louis: The C. V. Mosby Company, 1942. Price \$5.50.

Diseases of the skin are presented in condensed form, emphasizing the things commonly seen, and omitting the rare diseases that have only an academic interest for most practitioners. The grouping of diseases is logical, as dermatoses due to viruses and rickettsiae, bacteria, fungi, protozoa metazoa, and metabolic. Then atrophies, neuroses, pigmentations and depigmentations, malformations and new growths. The language is clear, brief, but adequate. The paper is good, the print clear, sufficiently large, and the book easily of pocket size, with a semiflexible cover.

BURNS, SHOCK, WOUND HEALING AND VASCULAR INJURIES. Prepared by the Committee on Surgery of the Division of Medical Sciences of the National Research Council. Illustrated. Philadelphia & London: W. B. Saunders Company, 1943. 260 pages, \$2.50.

This is the fifth of a series of six valuable books prepared by the National Research Council, summarizing standard treatment recommended by medical men on this committee for wartime emergencies. Roy D. McClure, Conrad Lam, Henry N. Harkins and James Barrett Brown present an up to date résumé of burn therapy and plastic surgery, outlining treatment of acute burns, old burns, and deformities resulting from burns. There is a chapter on burns in chemical war-

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fare. Alfred Blalock and his committee of six summarize modern treatment of shock and outline modern concepts of the mechanism of shock.

Allen O. Whipple has an excellent chapter on wound healing, with a summary of common civil injuries and war wounds as well. Pertinent up to date information on the treatment of vascular injuries is presented in the last chapter, prepared by John Homans and his committee of Arthur W. Allen, Daniel Elkin, Geza de Takats, and Walter G. Maddock. This manual is invaluable to the general man as well as the surgeon in present-day civil practice.

NEUROSURGERY AND THORACIC SURGERY: Military Surgical Manuals, Volume VI. Prepared and edited by the Subcommittee on Neurosurgery and Thoracic Surgery of the Committee on Surgery of the Division of Medical Sciences of the National Research Council. 310 pages with 103 illustrations. Philadelphia and London: W. B. Saunders Company, 1943. Price \$2.50.

The Medical Departments of the Army and Navy have recognized the great amount of specialization of the medical profession, and the need during this war to have well trained and competent men always available when needed. That is not possible under the conditions obtaining, so on the theory that training in special practice fits a man for other specialties with certain special help, six surgical manuals have been prepared for the use of those who are on the field or available when special treatment is necessary. These manuals are not textbooks but do contain the things necessary for a trained man to give the relief that will prove the most beneficial at the time when it is the most needed. Theoretically a specialist in most any field with the aid obtainable in these books can give first class attention to the wounded; at least until they can be placed under the care of the proper specialists. This book contains the essential information for the care of war injuries of nerves and neurological systems, also the field of thoracic surgery. Deaths from chest injuries are high, being about 33 per cent on the field, 25 to 30 per cent at dressing stations and 20 to 25 per cent in transportation. It is hoped to cut these figures down by the study of procedures given in this book.

A TEXTBOOK OF CLINICAL NEUROLOGY. By Israel S. Wechsler, M.D., Clinical Professor of Neurology, Columbia University, New York; Neurologist, The Mount Sinai Hospital; Consulting Neurologist, The Montefiore and Rockland State Hospitals, New York. Fifth Edition, Revised. 840 pages with 162 illustrations. Philadelphia and London: W. B. Saunders Company, 1943. Price \$7.50.

Four years have presented so much that is new in clinical neurology that a new edition is necessary. There is a preliminary chapter on interpretation of signs and symptoms, with a section of psychosomatic tests. The text then is devoted to diseases of the spinal cord, the peripheral nerves, the brain, and the neuroses. Many pictures are given showing diseased conditions or pathological specimens. The diseases described are fully presented, giving the symptoms and signs necessary to make a diagnosis, and the indications of the conditions described. The book is very complete, readable, has many references, and forty two pages of very good index. It is clinical rather than pedantic, and will prove most useful.



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CHEMOTHERAPY OF GONOCOCCIC INFECTIONS. By Russell D. Herrold, B.S., M.D., Associate Professor of Surgery (Urology), College of Medicine, University of Illinois, Chicago, Illinois, St. Louis: The C. V. Mosby Company, 1943. Price \$3.00.

Dr. Herrold reviews the history of the use of the sulfonamides in the treatment of gonorrhea. The diagnosis of the disease is given in sufficient detail, then he discusses the use of prontosil without too much success, and its practical abandonment. Sulfa-anilamide came next with promising results, but not completely satisfactory. Studies were made with various of the sulfa drugs, and finally two seem to have been satisfactory, sulfathiazole and better, sulfadiazine. Treatment is outlined in detail, and the handling of failures. Infections of women and children have their chapters. There are 62 illustrative case reports. This is a handy manual well prepared and authoritative.

ESSENTIALS OF GYNECOLOGY. By Willard R. Cooke, M.D., F.A.C.S., Professor and Head of Department of Obstetrics and Gynecology, University of Texas. 197 illustrations including 10 in color. Philadelphia: J. B. Lippincott Company, 1943. Price, \$6.50.

Designed primarily for the medical student and the general practitioner, this concise, very readable textbook covers the problems of gynecological practice in expert fashion. Dr. Cooke pruned this book to the essentials and therein lies one of its main virtues as a reference work for your library. The presentation of the gynecologic patient as a personality is unique, for in his history-taking and examination Dr. Cooke stresses in particular the important aspects of the

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patient's mode of life and psychology. The chapter on inflammatory disease of the female genital tract is complete and well done. Benign and malignant neoplasms are given adequate attention and accepted surgical procedures are listed in outline form. The treatment of postoperative complications is comprehensive.

FRACTURES OF THE JAWS, and Other Facial Bones. By Glenn Major, B.S., A.M., Ph.D., D.D.S., M.D., F.A.C.S. With chapters on radiographic technique by Lester M. J. Freedman, B.S., M.D., and War aspects of jaw fractures, by Arthur Dick, D.D.S., M.D., Major M.C., U.S.A. With 225 illustrations. St. Louis: The C. V. Mosby Company, 1943. Price, \$7.50.

Fractures of the jaws are no different fundamentally from other fractures, and the same rules of diagnosis and care apply. These, however, are of especial interest because of the areas involved, the proximity to important structures and the distressing complications that may develop.

The surgeon and the dentist are both interested. This book was prepared with that interest foremost. There are chapters on general discussion, diagnosis, replacement of fractures, and emergency treatment of fractures of the facial bones. Anesthesia is important and gets a well-considered chapter.

Then there are three hundred pages of consideration of types and principles of treatment, problems in restoring to usefulness the badly broken mandible; special fractures of the maxilla, diabetic care, x-rays, fractures of the nose. War injuries and their care are discussed. Medico-legal aspects are not forgotten. This is the field which probably offers most opportunity for legal action. Every type and method of bone fixation and control is illustrated and described.

The illustrations are good and completely adequate. The book is a ready and practical reference.

THE SIGHT SAVER. By C. J. Gerling. New York: Harvest House, 1943. Price, \$2.00.

"Most of the dread eye diseases once commonly thought to lead to blindness may now be successfully treated and halted, and often cured, if only treatment is begun early enough." This book consists of an introduction based upon the above quotation, and two hundred pages of an encyclopedia alphabetically arranged of very lucid and factual discussions of every conceivable topic from accommodation, acid in the eye, afterimages to xerophthalmia, x-rays and sight and yellow spot.

The discussion of appearance and wearing of glasses, automobile driving with defective vision, injuries, nerves of the eye, night blindness, etc., indicate a careful preparation and understanding. The author does not give treatment, he advises against self-treatment. The book is written for general use.

LAUGH AT THE LAWYER WHO CROSS EXAMINES YOU! A Court Room Antidote. By Charles L. Cusumano, LL.B., of the New York Bar. New York: Old Faithful Publishing Co., 1942.

The practice of the court room, and its means of determining justice are minutely set forth in this little book. The definition of what a witness is, and how he will be handled, the practices and customs of lawyers

and courts, are given in a narrative form. A number of rules are given for the benefit of those who only occasionally will become witnesses, such as: preserve the evidence, write it down so as not to forget; review the case with the attorney, review the facts before going on the stand; avoid contradictions; understand the theory of the case; aim to convince, be ready for cross examination, etc., to a total of twelve rules. There is a chapter on doctors as expert witnesses, with cautions and an exposition of the witness' rights. The book is interesting to pick up and read leisurely. There are many valuable hints, but the title is not entirely literal. The book strikes us as advisory rather than facetious.

HYPERTENSION. Summarizing Present Status of Incidence, Mortality, Morbidity, Symptoms, Classification, Pathogenesis, and Treatment of Arterial Hypertension. Chicago: Van Patten Pharmaceutical Co. On Request.

This forty page paper covered monograph is published without advertising in cover or text, and is a concise treatise on the subject. Graphs and charts are given. Diagnosis and clinical course, mechanism of elevating the blood pressure, and the latest information on treatment. It is a quick reference to late material.

THE PRINCIPLES AND PRACTICE OF WAR SURGERY. With Reference to the Biological Method of the Treatment of War Wounds and Fractures. By J. Trueta, M.D., formerly Director of Surgery, General Hospital of Catalonia, University of Barcelona; Assistant Surgeon (E.M.S.) Wingfield-Morris Orthopaedic Hospital, Oxford. With Introduction by Owen H. Wangensteen, M. D., Minneapolis, Minn. 144 Text Illustrations. St. Louis: The C. V. Mosby Company, 1943. Price, \$6.50.

The Spanish War was the occasion for much new knowledge besides modern war. Doctor Trueta developed and tried out his theories of the treatment of wounds, by what he calls the biological methods. This is the Doctor's second volume, but is much more extensive and he has carefully expounded his theories. Since the Spanish war he has had opportunity to work at the Wingfield-Morris Orthopaedic hospital and extend his researches. This material has all been given with detail and profuse illustrations. History of war surgery, and treatment of the prevailing infections and complications is given. Gas gangrene has a chapter. Blood transfusion, anesthesia, chemotherapy, shock are considered, then follows chapters on wound excision, drainage, reduction of fractures, use of plaster of Paris, skin grafts, et cetera. Plaster of Paris fixation is the all-important part of Trueta's treatment, but there are many other things he does, that are important. This little book is a valuable addition to any surgical library.

DOCTOR IN THE MAKING. The art of being a medical student. By Arthur W. Ham, M.D., Associate Professor of Anatomy, Toronto University, and M. D. Salter, M.A., Ph.D., Lecturer and Research Fellow in Psychology, University of Toronto. Philadelphia: J. B. Lippencott Company, 1943. Price, \$2.00.

This little book presents in entertaining form the thoughts and mental processes of a conscientious medical student. It would make good reading for the young person contemplating the study of medicine.



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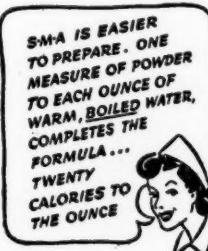
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